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ABSTRACT

In the spring of 1974, a sample of educators and educator-related groups in Alabama was asked to rate the importance of the 26 Alabama Right-to-Read Criteria for a successful reading program. In a second round of the study, a summary of round one results was sent to the entire sample, and ratings of the 26 criteria were again requested. Results indicated that the respondents rated the 26 criteria as being of extremely high importance or of high importance and moved, from round one to round two, toward greater homogeneity in their judgments. Criteria in the instruction category and the facilities/materials category were most highly rated. (Author/AA)

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TOWARD CONSENSUS:

THE ALABAMA RIGHT TO READ DELPHI STUDY

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The data analysis upon which the results of this study are based was conducted by Cindy Mable, a doctoral student in higher education at The Pennsylvania State University, where she is also a member of the information systems group. Ms. Mable did an exceptionally fine job in completing this analysis for us.

We trust that the results reported in this monograph will support the Alabama R2R effort as it moves toward its goal of increased reading competency for the state of Alabama.

ABSTRACT

In the spring of 1974, a questionnaire containing Alabama R2R's 26 criteria for a successful reading program was sent to a sample of educators and educator-related groups in the state of Alabama. The purpose of the questionnaire was to determine the degree of consensus among these groups about the importance of the 26 criteria for success. The respondents were asked to rate the importance of the criteria on a scale of 1 (extremely important) to 5 (no importance). The results of this round of the survey were then sent out to the initial group of respondents with a request to again rate the criteria, knowing this time how the other respondents had rated them. The results of the survey are as follows: The total group of Round 1 respondents (N = 919) rated half of the criteria of extremely high importance and half of high importance and were quite variable in their judgment (The majority of the criteria had a standard deviation of 1.0 to 1.5.). In Round 2, the respondents rated the criteria of the same degree of importance, but were only slightly variable in their judgments (standard deviation of .5 to .99). After the second round of the survey, a common population (those who responded to both rounds of the survey) was hand sorted from the total pile of questionnaires to determine if there were any significant differences between their judgments and the judgments of the total population. There were none. It can be said, therefore, that the educator and the educator-related groups in the state of Alabama rated the 26 criteria for a successful reading program of extremely high or high importance and that they moved toward greater homogeneity in their judgment between Rounds 1 and 2. Additionally, they rated the same criteria of the same importance, those in the top half of the ratings being in the instruction and facilities/materials categories.

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I/INTRODUCTION

Alabama Becomes a Right to Read State

The first significant step toward uniting the resources of Alabama, both financial and human, to achieve specific reading goals and objectives was taken on November 6-7, 1972, when the State Board of Education appointed Alabama's first Right to Read Advisory Commission.

When Dr. Ruth Love Holloway, National Director of R2R, addressed the first meeting of the Advisory Commission on January 10, 1973, she indicated that Alabama would soon be officially designated as a Right to Read state, qualifying it for a grant of $50,000 to establish an organizational structure at the state level. At this time, Dr. Holloway addressed the specific goals of R2R and presented the strategy for accomplishing them.

The Alabama State Department of Education responded by officially adopting the R2R Plan of Action and made commitments to the implementation of its requirements as a means of being designated a Right to Read state. In compliance with the Office of Education, the State Department of Education submitted a formal proposal on January 17, 1973, which included a statement of activities proposed for the implementation of the R2R Program. On June 6, 1973, Alabama received approval of its proposal and notification of its $50,000 grant award. The purpose of this award was to coordinate existing reading functions by building comprehensive reading programs through the skills and competencies developed by staff training. The participating schools received no monies for personnel or materials. For this reason, Alabama, at the request of the Office of Education, applied for and received an additional grant of $62,000 to train at least one reading director in every school system in the state.

Development of the Criteria for Success

At the first training program in the fall subsequent to the twenty-day summer training session, it was decided to try to identify the critical characteristics of a successful reading program. This procedure, it was hoped, would provide state unity on the goals of

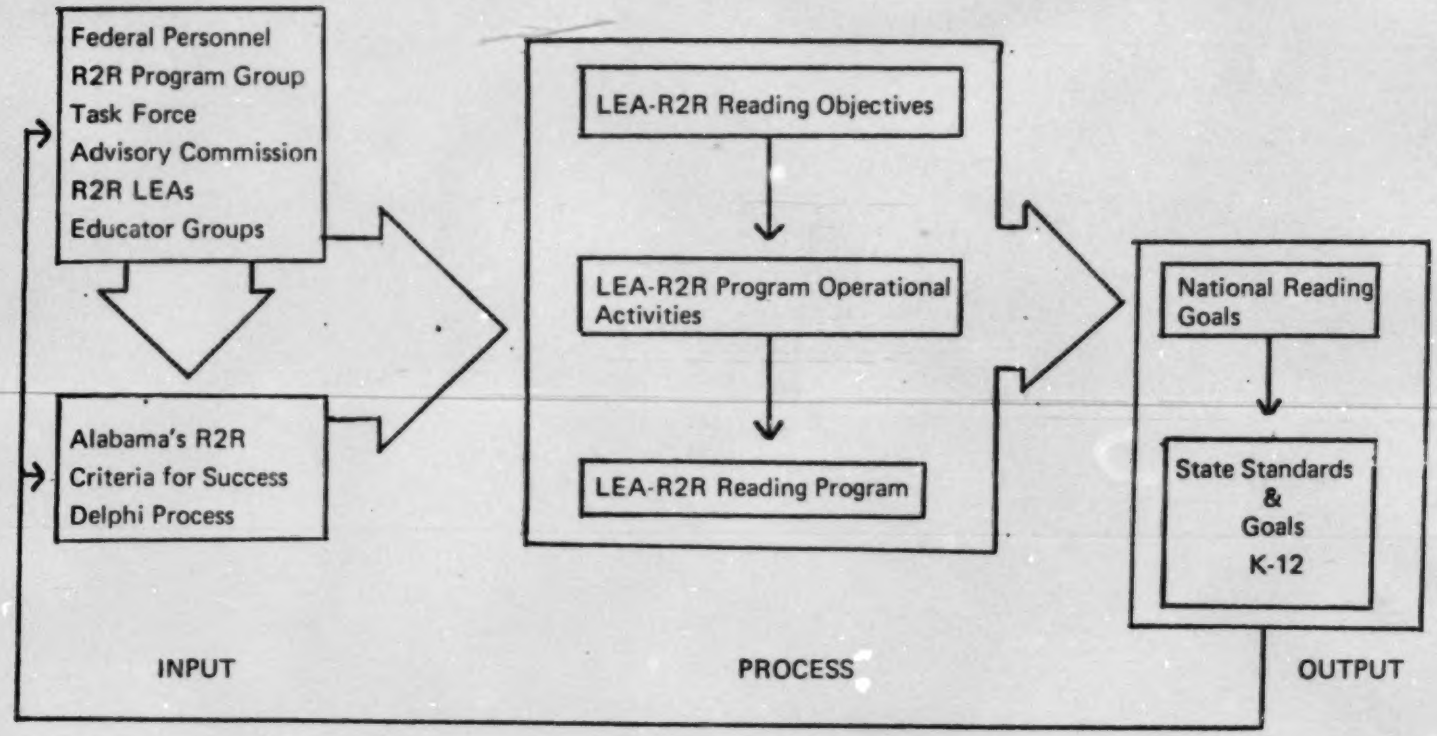

FIGURE 1
SYSTEM FOR ACHIEVING STATE AND NATIONAL RIGHT TO READ GOALS
ALABAMA R2R

R2R. Local educators in the 14 participating school districts, the state advisory commission, the task force, and reading specialists provided input for an initial set of 34 criteria (see Diagram 1). These criteria were eventually refined into a set of 26 that were formally accepted by the participating groups. (See the Delphi survey instrument in Appendix A for a list of the 26 criteria.)

The Delphi Study

This process of refining and adopting the criteria primarily involved getting group consensus which reflected a rather high degree of approval. However, group consensus is not considered to represent strong personal support, but a weaker form of public acceptance. It was felt that such public acceptance was not an adequate basis on which to claim approval of the criteria from the entire state, particularly in view of the unique position Right to Read occupies as a leadership program with no financial leverage to encourage local program development. Strong private commitment to the criteria was necessary. To obtain this kind of commitment, statewide consensus was sought from educators by using a procedure that would yield reliable data utilizing a highly respected statistical procedure for determining consensus—the Delphi technique. The criteria were submitted to 3,500 educators throughout the Alabama public schools, using the Delphi technique for obtaining group consensus.

The purpose of this monograph is to report the results of that Delphi survey.

II/THE DELPHI TECHNIQUE

The Concept of the Delphi

The Delphi technique can be defined as *a process to elicit and refine group judgments.*

The technique was originally designed by RAND Corporation for the purpose of using collective expertise to develop and refine policies, plans, or ideas that required informed judgment. The end product is consensus on a given topic.

The process has three basic steps. The first step is mainly concerned with eliciting the initial ideas, policies, plans, etc., which will be refined in steps two and three. This step is usually conducted by a group of experts different from those responding to the material. The second step is the initial response of the participants. The third step is the solicitation of a second response from the participants when they are given selected feedback on their initial group responses from step two. Step three, used once, or repeated as many as four times, constitutes the refinement cycle that results in consensus.

The steps in the process may be summarized briefly:

1. Elicit opinion.
   Elicit the opinions of experts, participants, or a selected audience about (a) specific, predetermined topic(s).
2. Evaluate.
   Ask the participants to evaluate a total list related to the topic(s) on the basis of some criterion, such as importance or criticalness.
3. Re-evaluate.
   Return the list to each participant along with a summary of the responses for each item given in step two and ask for re-evaluation or a reason for maintaining the initial choice if the participant's response varies from other participants.

The responses given in steps two and three are usually obtained with a survey instrument of some type, often a questionnaire.

The process just described has three common features: A first feature is *anonymous response.* that is, no respondent knows the exact response of any other respondent to any item on the questionnaire (or other survey instrument). A second feature is *interaction.* This is achieved through systematic feedback to the respondents of the group responses in each successive round. This systematic feedback is related to the third feature, *statistical*

group response. The statistics include such data as the mode, range, and location of a participant's response in relation to the responses of the entire group. In some cases, means and standard deviations are included.

These three features overcome three major obstacles to achieving consensus:

1. The effects of dominant individuals.
   Group opinion is highly influenced by dominant individuals who usually talk the most. There is very little correlation between the pressure of a group member's speech and his knowledge.
2. Irrelevant input.
   Much of the avowed problem-oriented discussion in group situations is irrelevant or biased because it is usually more concerned with individual and group interests than with problem solving.
3. Group pressure toward conformity.
   Face-to-face interchange and confrontation create pressure toward conformity that can distort individual judgment.

Value of the Delphi Technique

The Delphi technique has some special properties that tend to make its use in social systems desirable. It is a rapid and relatively efficient way to get significant data from key actors in a social system without having to use large amounts of time to determine key or critical incidents in a system's development. It overcomes the logistics problems of conflicting individual schedules which make group meetings impractical, expensive, and unrealistic. It requires much less individual effort to respond to a well-defined survey instrument than to participate in a conference or write out a paper, particularly since attempting to achieve consensus in a face-to-face situation may prevent the participant from giving his true view. The use of systematic procedures that are inherent in the technique tends to decrease the possibility of spurious outcomes. Anonymity and group response on items of common interest and concern provide for a sharing of responsibility while releasing respondent inhibitions.

Uses of The Delphi Technique

The Delphi technique was originally used in the 1960s as a method for organizing and sharing expert opinions about forecasts for the future. The technique sought to help

determine "a chronology of scientific and technology events and to judge when the events might occur based on the speculation of several experts." Since then, the Delphi has been used in industry for forecasting technological development and in other organizations for examining decisions on policies in education, public transportation, and public health.

The Delphi technique has had wide application in industry, business, education, and many other related fields. Many recent efforts have concentrated on the field of education in areas such as forecasting, goal identification and selection, and determining consensus. In the field of education, participant groups have included administrators, alumni, community, faculty, students, trustees, parents, and advisory councils, to name only a few.

In most Delphi studies, the data have been organized and collected in a specific manner. Based on the purpose of the study, a survey instrument is developed to determine expert opinion on specific items. These items might be concerned with such things as statements on goals or objectives or on future events. In most cases, the survey instrument contains an importance scale on which participants are expected to indicate the importance of a goal, event, or other item(s). One common scale used in Delphi studies is a five-point scale from 1 (most important) to 5 (least important). (The order can be reversed, with 1 standing for least important and 5 for most important.) Most Delphi studies require the participants to respond to the same items on repeated rounds. After each of the initial and subsequent rounds, participants are given feedback from the entire group. The feedback includes such data as the mode, range, and location of a participant's score on a given item compared to the location of scores of the entire group. In some cases, additional feedback data also include means and standard deviations.

One of the expected results of Delphi studies is that mean scores on individual items, as well as total scores, will tend to shift as rounds with the Delphi instrument(s) are conducted. There is generally variation in the degree and direction of shift, depending on the nature of the study. (Forecasting may have a greater shift than goal consensus.) In a study of institutional goals using 252 persons in higher education, 27 of whom were faculty, mean scores shifted between the first and third rounds on a survey instrument.

Goal Area	Round 1	Round 3	Change
1	2.1	2.3	.2
2	2.9	3.1	.3
3	2.3	2.3	0
4	2.4	2.4	0
5	3.0	3.1	.1
6	2.9	3.0	.2
7	2.9	2.9	0
8	2.9	3.1	.2
9	2.9	3.0	.1
10	3.6	3.8	.2
11	3.0	3.1	.1
12	2.8	2.8	0
13	3.2	3.0	−.2
14	2.9	2.9	0
15	2.4	2.3	−.1
16	3.3	3.3	0
17	2.5	2.5	0
18	2.1	2.0	−.1

NOTE: The average change toward the mean was only .05.

While the shift in mean scores is often insignificant, the decrease in dispersion of scores in many Delphi studies is significant. For the same group of 252 educators mentioned above in a study of institutional goals, the standard deviation decreased for 18 items on an eighteen-item scale.

	Standard Deviations		
Goal Area	Round 1	Round 3	Change
1	.59	.26	−.33
2	.53	.18	−.35
3	.52	.26	−.26
4	.56	.27	−.29
5	.59	.21	−.38
6	.76	.35	−.41
7	.67	.26	−.41
8	.62	.19	−.43
9	.56	.19	−.37
10	.65	.20	−.45
11	.55	.19	−.36
12	.55	.24	−.31
13	.91	.24	−.67
14	.63	.32	−.31
15	.68	.35	−.33
16	.57	.19	−.38
17	.56	.25	−.31
18	.57	.26	−.31

This change is typical of most Delphi studies. The standard deviation generally decreases between the first and subsequent rounds of interrogation.

Most Delphi studies indicate a variation in scores across individual items. It might be expected that any study which uses opinion and speculation to forecast future events or comment on desired goals or objectives would exhibit a wide range of scores. In subsequent rounds, this range has a tendency to decrease, with the second round producing the greatest change. *Recent studies on the number of repetitions or rounds to get a higher degree of consensus have tended to show, however, that most of the change occurs after the first modal distribution is reported to all participants and that additional rounds fail to produce any significant changes.* As subsequent rounds are conducted, the change in the range decreases. In sum, the responses to items on Delphi studies tend to vary considerably for the initial round and to a lesser degree for subsequent rounds.

Summary

The Delphi technique, then, is a method of determining consensus. Using some type of survey instrument (often a questionnaire), participants evaluate items on the instrument (often with a number), indicating the degree of importance of a given item based on their expert judgment. These responses are analyzed statistically to determine the degree of consensus. The statistical summary is then given to each participant who again rates the survey items. Knowing the degree of consensus, the individual has the opportunity to modify or retain his initial response. By this means, consensus can be approached without the inhibiting, conformity-inducing, time-consuming, and, sometimes, time-wasting procedure of face-to-face discussion. In the rounds following the initial pass, the greatest changes occur. Sometimes the mean decreases; usually the standard deviation does. This technique originated in business and industry and has had applications in other fields, including education.

III/THE DELPHI STUDY

Background and Purpose of the Study

Alabama Right to Read followed a national mandate to further improve the quality of its reading program statewide. In carrying out this mandate, Alabama desired to obtain statewide consensus on the goals of the program. A small group of those directly involved in R2R—the advisory commission, the LEA R2R directors, selected LEA educators, and the R2R task force—had developed a set of 26 criteria which they thought, based on their expert judgment, could be fundamental goals of Alabama's R2R effort. But they wished to achieve consensus statewide for purposes of building commitment to and a base for evaluation of the state effort. This need for statewide consensus was critical because R2R monies were supplied for purposes of improving existing reading programs. No monies were allocated to LEAs for staff; an additional grant from the U.S. Office of Education did, however, provide monies to train one LEA director in 14 participating school districts. In order to provide an effective bridge between the directors and the district personnel, it was necessary to achieve communication and agreement on the purposes of the program. The Delphi offered a means for achieving such consensus.

To achieve this consensus, a sample of educators throughout the state were surveyed. The groundwork for the development of this statewide survey had already been laid in the development of the criteria. All that was required was the development of a survey instrument that could be used as the basis of the Delphi technique.

Research Questions

The basic research question was: What degree of consensus exists in Alabama regarding the 26 criteria for success among the various major educator and education-related groups in the state? Specifically, What degree of consensus existed initially among these groups? What change was brought about by the use of the Delphi technique itself?

Methodology

In order to carry out the Delphi study, two steps were necessary: (1) construction of a sample and (2) the development of a survey instrument.

The Sample

Initially, fourteen categories of educators or education-related groups were identified. These groups were randomly sampled, ranging from a minimum of 10 percent of the larger groups, such as teachers, to a maximum of 100 percent of the smaller groups, such as local superintendents. The sample totaled 3,580 respondents. Table 1 presents the details of the sample.

TABLE 1
ALABAMA RIGHT TO READ DELPHI SAMPLE
Round 1

Respondent Group	Total Number	Number Sampled	Percent Sampled	Number Returned	Percent Returned
1. Superintendent/Asst. Super.	126	126	100	45	36
2. Elementary Principal	540	54	10	33	61
3. Middle/Jr. High Principal	400	40	10	14	35
4. High School Principal	440	44	10	21	48
5. LEA Supervisor/Director	234	58	25	29	50
6. Current LEA R2R Districts	14	14	100	9	64
7. Elementary Teacher	9,160	916	10	375	41
8. Middle/Jr. High Teacher	4,700	470	10	122	26
9. High School Teacher	11,758	1,758	10	158	9
10. Higher Ed. Reading Instr.	30	30	100	16	53
11. State R2R Advisory Comm.	31	31	100	5	16
12. State R2R Task Force	14	14	100	3	21
13. SDE Consultant	50	25	50	9	36
14. Other	–	–	80 ?	–	–
Total/Average	27,297	3,580	13.1	919[a]	26

[a]Only 902 of these were usable.

A total of 3,580 forms were sent out on February 7, 1974, with a request for return by March 5, 1974. Of the 919 (25.6%) returned, 909 (25.3%) were usable. The sample included all levels of educational management, teachers, and those directly involved in the R2R effort (the districts, advisory commission, task force), consultants, and reading instructors in institutions of postsecondary education. These 919 responses constitute the total population response of Round 1, i.e., all those who responded.

Only the 919 respondents of Round 1 were sent a survey form in Round 2. A total of 599 responses were returned. These constitute the total population response for Round 2.

A common population (those who responded to both rounds) was identified after the Round 2 results were sent in. This population totaled 525, not 599. This was due to the failure of some respondents to fill in their name on the form or to the fact that a person different from the person the form was sent to filled it out. These responses could be counted for the total population but not for the common population.

The Survey Form

The survey form used in Rounds 1 and 2 consisted of a listing of the 26 criteria for success developed and refined by the R2R directors, LEA educators, the R2R task force, and the R2R advisory commission in the fall of 1973. A copy of the instrument, on which is marked the summary results obtained in Round 1, is attached as Appendix A. This marked form was sent to the respondents for Round 2.

The instrument asks the respondents to indicate the degree of importance of each criterion on a five-point scale from extremely high importance (5) to no importance (1). A category of "don't know" (0) was also provided as a possible response. The format of the items was like the following example:

	Extremely High Importance	High Imp.	Med. Imp.	Low Imp.	No Imp.	Don't Know
20. Provisions are made for teaching every student at his own instructional level and learning rate.	5	4	3	2	1	0

Respondents were asked to circle the number which best expressed their judgment.

In discussing the results of Rounds 1 and 2 of the survey, the following terms and definitions are used:

4-5	Extremely high importance
3-3.99	High importance
2-2.99	Medium importance
1-1.99	Low Importance
Less than 1	No importance

On the item above, the mean Round 1 response was 4.62. In discussing the responses, this report uses the convention "according to the general (or total) group of respondents, it is of *extremely high importance* that this criterion be part of the Alabama R2R program." In indicating the measure of central tendency, the results refer to the mean response, unless specified otherwise.

The measure of dispersion (the spread of scores about the mean) of responses used in this report is the standard deviation (SD). In discussing differences of opinion or dispersion, the following conventions are used:

SD	Meaning
Above 1.5	Greatly variable
1.0 to 1.5	Quite variable
.50 to .99	Slightly variable
Below .50	Good agreement

Again using item #20 as an example, the SD of responses on degree of importance for all respondents in Round 1 was .85. Using the conventions in these instances, it can be said that "our respondents were *slightly variable* in their views on the importance of criterion #20."

IV/RESULTS: ROUNDS 1 and 2

A copy of the Delphi survey instrument is included as Appendix A. Summary statistics covering all items are included as Appendix B. Individual statistics for each of the 14 respondent groups are included as Appendix C. The results of Rounds 1 and 2 of the survey are discussed in this section. First the total population responses are discussed, then the common population; then the two populations are compared.

Total Population

Round I

Overview

The mean (average) responses for Round 1 are half in the very high importance category and half in the high importance category. This means that half of the criteria are considered of very high importance to the Alabama R2R educators and half are considered of high importance. The range of means is from 4.62 to 3.18. The majority of the standard deviations (20 of the 26) are in the quite variable category (1.0 to 1.5SD). Of the remaining six items, five are in the slightly variable category (.50 to .99SD), and one is in the greatly variable category (above 1.5). The range of standard deviations is from 1.60 to .70.

Criteria Judged of Extremely High Importance

The criteria in this group are 1, 3, 8, 10, 12, 15, 18, 20, 21, 22, 23, 25, and 26. By rank they are as shown in Table 2. Three ties in rank occur: *Individualized Instruction* and *Positive Environment* are tied for first place with a mean of 4.62; *Scope and Sequence of Learnings* and *Supplementary Reading Materials* are tied for fourth place with a mean of 4.35; and *Training of Content Area Teachers* and *Individual Student Record-Keeping System* are tied for seventh place with a mean of 4.21. The range of means is from 4.62 to 4.02.

TABLE 2

CRITERIA JUDGED OF EXTREMELY HIGH IMPORTANCE
ROUND 1 TOTAL POPULATION

Rank	Criterion No.	Mean	Criterion Descriptor
1.5	20	4.62	Individualized Instruction
1.5	21	4.62	Positive Environment
3.0	22	4.37	Teacher Use of Various Reading Methods and Techniques
4.5	1	4.35	Scope and Sequence of Learnings
4.5	23	4.35	Supplementary Reading Materials
6.0	10	4.26	Variation of Student-Teacher Ratios as Necessary
7.5	12	4.21	Training of Content Area Teachers
7.5	3	4.21	Individual Student Record-Keeping System
9	25	4.15	Supportive Media
10	8	4.11	Media Center
11	18	4.08	Sharing of Instructional Methods
12	15	4.07	LEA Director of All Reading Activities
13	26	4.02	Central Location for Reading Materials

Criteria Judged of High Importance

The criteria in this group are 2, 4, 5, 6, 7, 9, 11, 13, 14, 16, 17, 19, 24. By rank they are as shown in Table 3. There is only one tie: *Report to Parents* and *Coordination with Preschool Program* are tied for sixteenth place.

TABLE 3

CRITERIA JUDGED OF HIGH IMPORTANCE
ROUND 1 TOTAL POPULATION

Rank	Criterion No.	Mean	Criterion Descriptor
14	2	3.85	Coordination and Articulation of All Special Reading Programs with the Basic Curriculum
15	14	3.83	Media Center Staffed by Professional and Supportive Personnel
16.5	16	3.82	Report to the Parents
16.5	4	3.82	Coordination with Preschool Program
18	11	3.81	Continuous Staff Development
19	9	3.79	Complete LEA Testing System
20	24	3.73	Materials Recognize Variations in Race, Culture, Sex
21	7	3.69	Incentives for Staff Development
22	19	3.61	Jr.-Sr. High Teacher Knowledge of Developmental Reading
23	6	3.56	Continuous Reading Program
24	17	3.42	Report to the Community
25	13	3.40	Trained Volunteer Helpers
26	5	3.18	Adult Basic Education Reading Component

Standard Deviation in Round I

When the standard deviations for Round 1 are considered, it is possible to define further the answer to the question "How much consensus exists about the 26 criteria for success in the total population in Round 1?"

As indicated earlier, the respondents judged half of the criteria to be of extremely high importance and half to be of high importance; but they are quite variable (1.0 to 1.5SD) in their views on all but six criteria (see Table 4). For those six, they are slightly varied in their views about five (.50 to .99SD) and greatly varied for one (SD above 1.5). The criteria about which there is slight variation are 20, 21, 22, 23, and 25. Of these, four (20, 21, 22, and 23) are also the top four in rank. As a group, they comprise all but one of the total criteria in the instruction category.

TABLE 4
STANDARD DEVIATION
ROUND 1 TOTAL POPULATION

SD Category		No. of Items	Item Nos.
> 1.5	Greatly variable	1	19
1.0-1.5	Quite variable	20	1-18, 24
.5- .99	Slightly variable	5	20, 21, 22, 23, 25
<.5	Good agreement	0	
	Total	26	

Discussion

The results of Round 1 show that the total population who responded to the survey judge half of the criteria to be extremely important and half to be highly important and that they are quite variable in their judgment. The criteria which received the strongest support are the criteria in the instruction and facilities and materials categories. To explain:

The 26 criteria were grouped by category when they were developed. The breakdown and the number of criteria in each category are as follows:

Criterion Nos.	Category	
	I. Organization and Administration	
1-9	A. Program	9
10-15	B. Staff	6
16-18	C. Community Relations	3
19-22	II. Instruction	4
23-26	III. Facilities and Materials	4
	Total	26

In Round 1, the distribution by category of very highly supported and highly supported criteria are:

	Very Highly Supported	Highly Supported	Row Total
Organization & Administration			
Program	3	6	9
Staff	3	3	6
Community Relations	1	2	3
Instruction	3	1	4
Facilities & Materials	3	1	4
Column Total	13	13	26

Round II

Sample

Only the 919 respondents to Round 1 were included in the second mailing (see Table 1 for a breakdown by category). Of these, 599 (65%) responded, a high return rate. This rate is higher than the 26% return of Round 1.

Survey Form

The survey form shown in Appendix A, with the mean responses from Round 1 entered on it, was sent to the respondents on April 1, 1974, with a request to return by April 26, 1974.

Overview

The responses of the total group in Round 2 show little change in judgment about the degree of importance of criteria. Where changes do occur they are positive in all cases but one where the change is so small as to be negligible. The standard deviation decreased for all criteria. Both of these changes indicate a greater consensus from Round 1 to Round 2.

Criteria Judged of Extremely High Importance

The criteria in this group are the same as in Round 1, with the addition of one, #14, which moved up out of the high importance category. By rank they are as shown

in Table 5, which also compares the ranks with those of Round 1 and shows the amount of change in the mean from Round 1 to Round 2.

The major change in rank here is the resolution of the ties from Round 1 for items 20 and 21, 23 and 1, and 3 and 12. The means of all criteria all became more positive, but by such a small percentage (+.14) as to be insignificant.

TABLE 5
CRITERIA JUDGED OF EXTREMELY HIGH IMPORTANCE
ROUND 1 vs. ROUND 2 TOTAL POPULATION

Rank Round 1	Rank Round 2	Item No.	Mean	Change	Descriptor
1.5	1	20	4.74	+.11	Individualized Instruction
1.5	2	21	4.73	+.11	Positive Environment
3	3	22	4.62	+.25	Teacher Use of Various Reading Methods and Techniques
4.5	4	23	4.58	+.23	Supplementary Reading Materials
4.5	5	1	4.46	+.11	Scope and Sequence of Learnings
6	6	10	4.42	+.16	Variation of Student-Teacher Ratios as Necessary
7.5	7	3	4.34	+.13	Individual Student Record-Keeping System
9	8	25	4.33	+.19	Supportive Media
7.5	9	12	4.30	+.08	Training of Content Area Teachers
10	10	8	4.29	+.18	Media Center
11	11	18	4.17	+.09	Sharing of Instructional Methods
12	12	15	4.16	+.09	LEA Director of All Reading Activities
13	13	26	4.14	+.11	Central Location for Reading Materials
14	14	14	4.00	+.17	Media Center Staffed by Professional and Supportive Personnel
		Average Change		+.14	

Criteria Judged of High Importance

The criteria in this group are the same as in Round 1 with the exception of #14, the criterion that moved up into the extremely high importance category. The rankings show more shifting than the items in the extremely high importance category. The average increase in mean (+.08) is again such a small percentage as to be unimportant (See Table 6).

Standard Deviation in Round 2

The slight increase in mean value for most of the criteria, while not significant in itself, does indicate a movement toward greater consensus which, when considered with the changes in standard deviation in Round 2, is significant. Standard deviation for all items decreased in Round 2, with an average decrease of .34. A comparison of

TABLE 6

CRITERIA JUDGED OF HIGH IMPORTANCE
ROUND 1 vs. ROUND 2 TOTAL POPULATION

Rank Round 1	Rank Round 2	Item No.	Mean	Change	Descriptor
14	15	2	3.91	+.05	Coordination & Articulation of All Special Reading Programs with the Basic Curriculum
19	16	9	3.90	+.11	Complete LEA Testing System
16.5	17	16	3.87	+.05	Report to the Parents
18	18	11	3.87	+.06	Continuous Staff Development
16.5	19	4	3.82	+.00	Coordination with Preschool Programs
22	20	19	3.81	+.20	Jr.-Sr. High Teacher Knowledge of Developmental Reading
21	21	7	3.79	+.11	Incentives for Staff Development
20	22	24	3.78	+.05	Materials Recognize Variations in Race, Culture, Sex
23	23	6	3.67	+.11	Continuous Reading Program
25	24	13	3.45	+.06	Trained Volunteer Helpers
24	25	17	3.39	+.03	Report to the Community
26	26	5	3.34	+.15	Adult Basic Education Reading Component
		Average Change		+.08	

TABLE 7

STANDARD DEVIATION: ROUND 1 VS. ROUND 2
TOTAL POPULATION

SD Category		Round 1	Round 2	Item No.
> 1.5	Greatly variable	1	0	–
1.0–1.5	Quite variable	19	3	5, 13, 19
.5– .99	Slightly variable	6	23	all others
< .5	Good agreement	0	0	–
	Total	26	26	

the number of items in each of the four standard deviation categories is shown in Table 7 above.

In Round 2, the 1 item in the greatly variable category moved into the quite variable category and 17 items from the quite variable category moved into the slightly variable category. The range of standard deviation in Round 2 is from 1.08 to .56; in Round 1, from 1.60 to .70, a decrease of one full category amount at the upper end point (1.60 – 1.08 = .52). The standard deviation in Round 2 indicates primarily slight differences of opinion for all items.

Discussion

The overall positive change in means (though in itself insignificant) and standard deviation, when taken together, indicate an increase in the degree of consensus about the

26 criteria for success among educator groups in Alabama from Round 1 to Round 2. The lack of change in the means is not untypical of Delphi studies. The change in standard deviation is more common.

What the change in standard deviation means essentially is that the divergence of the scores from the mean (or the spread of scores about the mean) has decreased. This means more respondent agreement about a given item, in this case, a criterion.

This greater consensus is the goal of the Delphi technique. It means, in the case of Alabama's R2R effort, that the total group of educators feel that most of the 26 criteria for success are judged of high or very high importance and that there is only slight variation about this judgment. Such consensus is necessary to successful program implementation and operation.

COMMON POPULATION

Round 1

Sample

The common population consists of those 525 respondents who filled out the survey form in both rounds of the survey. This list of 525 was established by hand sorting through the total set of returned questionnaires. This procedure was followed in order to determine if any significant differences existed between those who responded to both rounds of the survey and those who responded only to Round 1; that is, if any bias existed in the common population.

Overview

The mean responses for Round 1 are half in the very high importance category and half in the high importance category. The range of means is from 4.70 to 3.23. The standard deviations indicate a fair amount of difference of opinion about the mean: 1 is in the greatly variable category, 15 are in the quite variable category, and 10 are in the slightly variable category. The range of standard deviations is from 1.57 to .56.

Criteria Judged of Extremely High Importance

The criteria in this group are 1, 3, 8, 10, 12, 15, 18, 20, 21, 22, 23, 25, and 26. These comprise half of the 26 criteria. By rank they are as shown in Table 8. One tie occurs—for first place—between numbers 21 and 20, *Positive Environment* and *Individualized Instruction.* The range of means is from 4.70 to 4.07.

TABLE 8
CRITERIA JUDGED OF EXTREMELY HIGH IMPORTANCE
ROUND 1 COMMON POPULATION

Rank	Criterion No.	Mean	Criterion Descriptor
1.5	21	4.70	Positive Environment
1.5	20	4.70	Individualized Instruction
3	1	4.43	Scope and Sequence of Learnings
4	22	4.41	Teacher Use of Various Reading Methods and Techniques
5	23	4.37	Supplementary Reading Materials
6	10	4.32	Variation of Student-Teacher Ratios as Necessary
7	12	4.26	Training of Content Area Teachers
8	3	4.22	Individual Student Record-Keeping System
9	8	4.18	Media Center
10	25	4.17	Supportive Media
11	18	4.12	Sharing of Instructional Methods
12	26	4.08	Central Location for Reading Materials
13	15	4.07	LEA Director of All Reading Activities

Criteria Judged of High Importance

The criteria in this group are 2, 4, 5, 6, 7, 9, 11, 13, 14, 16, 17, 19, and 24. They comprise the remaining half of the 26 criteria. One tie occurs—between numbers 9 and 16, *Complete LEA Testing System* and *Report to the Parents.* The range of means is from 3.99 to 3.23. (See Table 9 on page 21.)

Discussion

If we consider the original grouping of the criteria into categories of organization and administration, instruction, and facilities and materials, as shown in the Discussion section for the total population, the degree of support by category for these criteria is exactly the same as for the total population because the same criteria are in the "extremely high" and "high" importance categories for each group. This would seem to indicate general agreement between the total population and the common population about which criteria were of the highest importance.

TABLE 9

CRITERIA JUDGED OF HIGH IMPORTANCE
ROUND 1 COMMON POPULATION

Rank	Criterion No.	Mean	Criterion Descriptor
14	2	3.99	Coordination and Articulation of All Special Reading Programs with the Basic Curriculum
15	4	3.91	Coordination with Preschool Program
16	14	3.89	Media Center Staffed by Professional and Supportive Personnel
17.5	9	3.85	Complete LEA Testing System
17.5	16	3.85	Report to the Parents
19	11	3.84	Continuous Staff Development
20	24	3.77	Materials Recognize Variations in Race, Culture, Sex
21	7	3.75	Incentives for Staff Development
22	19	3.68	Jr.-Sr. High Teacher Knowledge of Developmental Reading
23	6	3.55	Continuous Reading Program
24	17	3.47	Report to the Community
25	13	3.42	Trained Volunteer Helpers
26	5	3.23	Adult Basic Education Reading Component

TABLE 10

STANDARD DEVIATION
ROUND 1 COMMON POPULATION

SD Category		No. of Items	Items
> 1.5	Greatly variable	1	19
1.0-1.5	Quite variable	15	2, 4, 5, 6, 7, 8, 9, 10, 11, 13, 14, 15, 16, 24, 26
.5- .99	Slightly variable	10	1, 3, 10, 12, 18, 20, 21, 22, 23, 25
< .5	Good agreement	0	
	Total	26	

Standard Deviation in Round 1

The standard deviation for the common population, as it did for the total population, makes it possible to determine more clearly the degree of consensus which exists about the 26 criteria for success in the common population in Round 1.

As indicated earlier, the common population respondents judged half of the criteria to be of extremely high importance and half of high importance. They are greatly variable in their agreement about 1 of these, quite variable in their agreement about 15, and slightly variable about 10. The range of standard deviations is from 1.57 to .56.

Discussion

The results of Round 1 of the Delphi survey for the common population indicate that the respondents consider half of the criteria of extremely high importance and half

of high importance and that they are only moderately variable in their judgments. They are quite like the total population in their degree of consensus, except that they show less variability in their judgments because they have only 15 criteria in the quite variable SD category, compared to the total population's 19; likewise, they have 10 criteria in the slightly variable SD category, compared to the total population's 6.

Round 2

Overview

The responses of the common population in Round 2 show little change in judgment about the degree of importance of the criteria. Where changes do occur they are primarily positive, although not significantly so. The standard deviation decreased for all criteria.

Criteria Judged of Extremely High Importance

The criteria in this group are the same as in Round 1, with the addition of one, #16, *Report to the Parents.* By rank they are as shown in Table 11, which also compares the ranks with those of Round 1 and shows the amount of change in the mean in the Round 2 responses. All means increased positively, but not significantly. Average increase is +.12. A number of criteria moved up in rank; noteworthy are those whose increase in mean score is almost twice the average. These are criteria numbers 22, 23, and 25. As these moved up, others moved down.

Criteria Judged of High Importance

The criteria in this group are the same as in Round 1, with the exception of #15, which moved out of the very high importance category. All criteria shifted in rank except #23 which remained 23rd in rank. A number of ties emerged in this round: criteria numbers 16 and 9 tie for 16th place; criterias 4, 7, 19, and 24 are tied behind the 18th ranking criteria. All but three criteria increased in mean, but by insignificant amounts. The average increase is only +.04.

TABLE 11

CRITERIA JUDGED OF EXTREMELY HIGH IMPORTANCE
ROUND 1 vs. ROUND 2 COMMON POPULATION

Rank Round 1	Rank Round 2	Item No.	Mean	Change	Descriptor
1.5	1.5	21	4.77	+.07	Positive Environment
1.5	1.5	20	4.77	+.07	Individualized Instruction
4	3	22	4.63	+.22	Teacher Use of Various Reading Methods and Techniques
5	4	23	4.60	+.23	Supplementary Reading Materials
3	5	1	4.48	+.05	Scope and Sequence of Learnings
6	6	10	4.45	+.13	Variation of Student-Teacher Ratios as Necessary
10	7	25	4.37	+.20	Supportive Media
8	8	3	4.33	+.11	Individual Student Record-Keeping System
7	9	12	4.32	+.06	Training of Content Area Teachers
9	10	8	4.28	+.10	Media Center
11	11	18	4.19	+.07	Sharing of Instructional Methods
12	12	26	4.17	+.09	Central Location for Reading Materials
13	13	15	4.16	+.09	LEA Director of All Reading Activities
17.5	14	16	4.00	+.15	Report to the Parents
		Average Change		+.12	

TABLE 12

CRITERIA JUDGED OF HIGH IMPORTANCE
ROUND 1 vs. ROUND 2 COMMON POPULATION

Rank Round 1	Rank Round 2	Item No.	Mean	Change	Descriptor
14	15	2	3.91	−.08	Coordination & Articulation of All Special Reading Programs with the Basic Curriculum
17.5	16.5	16	3.90	+.05	Report to the Parents
17.5	16.5	9	3.90	+.05	Complete LEA Testing System
19	18	11	3.87	+.03	Continuous Staff Development
15	20.5	4	3.82	−.09	Coordination with Preschool Programs
21	20.5	7	3.82	+.07	Incentives for Staff Development
22	20.5	19	3.82	+.14	Jr.-Sr. High Teacher Knowledge of Developmental Reading
20	20.5	24	3.82	+.05	Materials Recognize Variations in Race, Culture, Sex
23	23	6	3.68	+.13	Continuous Reading Program
25	24	13	3.48	+.06	Trained Volunteer Helpers
24	25	17	3.40	−.07	Report to the Community
26	26	5	3.32	+.09	Adult Basic Education Reading Component
		Average Change		+.04	

Standard Deviation in Round 2

The slight increase in mean value for most of the criteria, while not significant in itself, does indicate a movement toward greater consensus which is significant in the standard deviation changes in Round 2. Standard deviations for all items decreased in Round 2, with an average decrease of .29. A comparison of the number of items in each of the four standard deviation categories is shown in Table 13.

TABLE 13

STANDARD DEVIATION: ROUND 1 vs. ROUND 2
COMMON POPULATION

SD Category		Round 1	Round 2	Item No.
> 1.5	Greatly variable	1	0	
1.0–1.5	Quite variable	15	3	5, 13, 19
.5– .99	Slightly variable	10	23	all others
< .5	Good agreement	0	0	
	Total	26	26	

In this round, the 1 item in the greatly variable category moved into the quite variable category and 12 items moved into the slightly variable category. The range of standard deviations in this round is from 1.05 to .47 (1.57 to .56 in Round 1), a decrease of one full category at the upper limit (1.57 – 1.05 = .52). Thus, the standard deviation in Round 2 indicates primarily slight differences of opinion among the common population about most of the criteria.

Discussion

The overall positive change in means (though in itself insignificant) and standard deviations, when taken together, indicate an increase from Round 1 to Round 2 in the degree of consensus among the common population of educator respondents in Alabama. The lack of significant change in the means, as was mentioned in the discussion of the total population respondents, is not untypical of Delphi studies. The change in standard deviations is more common. This change in standard deviation indicates that the respondents in the common population are less spread apart from the mean in their responses. This indicates greater consensus overall among the group for the respective criteria. In other words, it could be said that the common group of educators feel that most of the 26 criteria for success are of high or very high importance and that there is only slight disagreement about these judgments.

V/CONCLUSIONS

The Total Population vs. The Common Population

The total population (all those who responded in each round) was compared to the common population (those who responded to both rounds of the survey) to determine if any significant differences existed between those who answered both rounds and those who did not. A major question is what difference existed in the two groups in Round 1, since in Round 2 the total and common populations are nearly identical.

The data show no significant differences between the two groups; the several differences which do exist show the common population to judge the criteria of very slightly greater importance than the total population and to have less disagreement about their judgments. These differences are shown by the differences in the means and the standard deviations, respectively, for the two groups. To illustrate:

ROUND I MEANS

	Common Pop.	Total Pop.
High Mean	4.70	4.37
Low Mean	3.33	3.18
Range	1.37	1.19

The higher high and low means of the common population show the common group to place slightly higher importance on the criteria. These differences between the high and low means are not equal to even one of the smallest standard deviations, so they are not significant.

As far as the standard deviations are concerned, the data show the following:

ROUND 1 STANDARD DEVIATIONS

SD Category	Common Pop.	Total Pop.
Greatly variable	1	1
Quite variable	15	19
Slightly variable	10	6
Good agreement	0	0
Total	26	26

In this round, the common population placed only 15 criteria in the quite variable category compared to 19 for the total population. Furthermore, the common group placed

only 10 criteria in the slightly variable category compared to 6 for the total population. In every case, the common population had a lower standard deviation, although all deviation differences were within 0.1 of each other for each criterion.

Some interesting similarities exist between the two groups. Both groups placed the same criteria in the same category: each put half in the extremely high importance category and half in the high importance category. While each group did not rank the criteria in precisely the same order, they did put them in roughtly the same quartile (top half of extremely high importance, bottom half of extremely high importance, top of high importance, and bottom of high importance). This means that the two groups agree about the degree of importance of the 26 criteria.

Thus, to reiterate: there is no significant difference in ratings or standard deviations between the total and common populations of the Delphi survey. Equally important, similarities do exist which show that the two groups essentially see the 26 criteria as of high or very high importance and disagree very little about their judgment. They have also ranked the criteria in roughly the same way, placing their strongest support in the criteria in the instruction and facilities/materials categories.

Summary and Discussion

This Delphi survey, undertaken as part of the Alabama R2R program in the first year of its inception, was intended to provide input to the project staff, feedback to the respondents, and information to other states undertaking a R2R effort with the possibility of duplicating the effort in their state. The instrument consisted of a listing of the 26 criteria for success developed by the Alabama educators with a request to rank the importance of the 26 criteria on a five-point scale (5 = extremely high importance, 1 = no importance). Two rounds of the survey were completed in the spring of 1974 as reported in the preceding pages.

The detailed results obtained in Rounds 1 and 2 of the survey are given in earlier sections of this report. Only a few of the more general observations are discussed here. Since there was no significant difference between the total population (all respondents) and the common population (the 525 persons who responded to both rounds of the survey), this section will highlight the major survey results.

The results of the survey in both Rounds 1 and 2 show a very high degree of importance placed upon each of the 26 criteria. In Round 2 responses all standard deviations decreased, with an average decrease of .34 for the total population. This indicates that the survey technique did, in fact, serve both as a means of determining whether consensus existed about the criteria and of strengthening that consensus. So, in answer to the questions: What degree of consensus existed about the 26 criteria for success among educators and educator-related groups in Alabama, it can be said that a strong consensus initially existed and that this consensus was strengthened by the second round of the survey.

Half (13) of the criteria were considered of extremely high importance and half (13) of high importance in Round 1; in Round 2 the numbers are 14 and 12, respectively. Some interesting observations about the rankings can be made. First of all, of the 13 criteria which the respondents judged of extremely high importance, 10 of these are among the 15 that were highly supported by the literature search that was undertaken to determine what degree of support for the criteria existed in the literature. The results of this literature search are detailed in the Alabama State Department of Education publication: "A Literature Search to Determine the Degree of Support for the Alabama Right to Read Criteria for Success," published as a companion study to the study reported in this monograph. These 10 are numbers 1, 3, 8, 10, 12, 15, 20, 22, 23, and 25.

Second, the distribution of criteria judged of extremely high importance and high importance respectively by the respondents shows that the criteria with the highest mean ratings (those judged of extremely high importance) included most of the criteria from the instruction, facilities/materials, and staff categories, categories which also received high support from the total literature search.

Third, those criteria in the top half of the ratings shifted little in rank from Round 1 to Round 2 while those in the bottom half shifted around considerably. This seems to indicate less certainty of judgment about these criteria.

In general, those who managed this Delphi procedure are satisfied that a large fund of significant data has been obtained and that the technique is a valuable one for educators. It might be valuable for the technique to be used by other states for this or similar project efforts.

Implications of the Study

Perhaps the most significant part of the study results point to the level of acceptance on the part of all support groups. By knowing this level and the degree to which consensus was achieved, the R2R staff knew where most of their efforts would need to be applied. In cases where there was a low level of acceptance of criteria by subgroups in the state, special orientation efforts could be conducted to increase the level. In instances where certain criteria had low acceptance and others had high acceptance before or after Round 2, R2R staff were very much aware of this kind of subgroup opposition.

Since the development of R2R programs is based on the criteria and their acceptance and operationalization by all subgroups, the degree of acceptance takes on a far greater importance in the development process. The acceptance of the criteria implies the need for a massive reorganization of reading efforts in most school districts. Such efforts will require the complete support of all district personnel. Realizing that even one group in a district would actively oppose any of the criteria is an indication that a critical element of the R2R program may not be implemented. On the basis of the Delphi data, the R2R staff can better evaluate where its statewide efforts need to be placed. Time and staff resources can be effectively and efficiently placed with this type of information.

Another significant result of the study concerns measuring the effectiveness of input. That is, when intervention and orientation strategies are used to educate subgroups about criteria which they oppose, the degree to which their attitudes and opinions change can be accurately assessed through the continued use of the instrument through a third round for those criteria about which there is concern.

The last and most significant aspect of the study concerns the ability of the instrument to provide an overall perspective statewide for the development of a major reading program. From this perspective, an entire reading effort can be launched with a knowledge of the degree of acceptance of its major components as well as where the major obstacles would occur. Such a perspective must be extremely valuable to any R2R state's planning and development efforts.

Appendix A: Delphi Survey Instrument

ALABAMA RIGHT TO READ PROGRAM
ALABAMA STATE DEPARTMENT OF EDUCATION

Dear Colleague:

A few weeks ago you received a letter requesting you to complete a questionnaire regarding criteria for a successful reading program. The response to that questionnaire was extremely favorable, and we appreciate the time you spent in working on it.

As we indicated in the initial set of documents, all responses have been analyzed, and we are now ready to begin the second phase of the study. The original questionnaire has been modified to include the average response from individuals in your group for each of the criteria. With this average which you will find printed on the questionnaire, we would like you to repeat the original process and evaluate the criteria a second time.

In order for this study to be valid, it is critical that you complete the questionnaire again. We feel that the time you spend in completing the questionnaire will be rewarded by providing information for Alabama to develop one of the finest Right to Read programs in the country.

Your cooperation in this effort is greatly appreciated. Please return the questionnaire before April 26, 1974.

Richard McBride, Director
Alabama Right to Read Program

ALABAMA RIGHT TO READ
DELPHI QUESTIONNAIRE INFORMATION

Please return questionnaire by April 26, 1974.

Fill in or complete the following

*1. Last Name _____ First Initial _____

2. School _____

3. School Address _____

4. School District _____

Circle the code number below that precedes the category of respondents to which you belong: e.g., 4.1, Superintendents or Assistant Superintendent.

Code Numbers	Category
4.1	Superintendent or Assistant Superintendent
4.2	Elementary Principal
4.3	Middle or Junior High Principal
4.4	High School Principal
4.5	Local Education Agency Supervisor or Director of Instruction
4.6	Current Local School District Right to Read Director
4.7	Elementary Teacher
4.8	Middle or Junior High Teacher
4.9	High School Teacher
4.10	Higher Education Reading Instructor
4.11	State Right to Read Advisory Commission
4.12	State Right to Read Task Force
4.13	SDE Consultant
4.14	Other _____ Specify

*All information provided by the respondents is confidential.

ALABAMA RIGHT TO READ
DELPHI QUESTIONNAIRE

Please circle the number of the categories below that are most closely related to your judgment of the importance of each criterion.

Array of Criteria for a Successful Reading Program (additional can be listed on final page).	Mean response	Extremely high 5	High 4	Medium 3	Low 2	None 1	Don't know 0
1. Each LEA teacher of reading uses a scope and sequence of learnings designed to insure the acquisition of reading skills.	4.3	5	4	3	2	1	0
2. There is coordination and articulation between all federally funded, volunteer, and other reading and language arts programs with the basic reading curriculum.	3.8	5	4	3	2	1	0
3. A continuous recordkeeping system of reading progress is maintained for each individual student.	4.2	5	4	3	2	1	0
4. The LEA works cooperatively with existing pre-school components to coordinate and articulate reading programs.	3.8	5	4	3	2	1	0
5. The LEA has an adult basic education reading component.	3.0	5	4	3	2	1	0
6. The LEA has a continuous educational program which includes provision for summer instruction in reading.	3.6	5	4	3	2	1	0
7. The board of education of the LEA has an incentive program for teacher staff development in reading.	3.6	5	4	3	2	1	0
8. Each school in the LEA has a media center which is operated on an open basis and is readily accessible to students and teachers.	4.0	5	4	3	2	1	0
9. The LEA has complete testing system which includes the use of criterion-referenced measures.	3.7	5	4	3	2	1	0
10. The LEA varies the student/teacher ratios as necessary to meet the objectives of the reading instructional program.	4.2	5	4	3	2	1	0
11. The LEA has a continuous staff development program in reading for all teachers, administrators, and supportive personnel.	3.7	5	4	3	2	1	0
12. The LEA provides training to teachers in the content areas to develop competence which will allow them to adjust instruction to the varying reading achievement levels of their students.	4.2	5	4	3	2	1	0
13. The LEA has trained volunteer helpers in reading instruction.	3.5	5	4	3	2	1	0
14. Each school in the LEA has a media center which is staffed by professional and supportive personnel.	3.8	5	4	3	2	1	0

		Mean response	Extremely high	High	Medium	Low	None	Don't know
			5	4	3	2	1	0
15.	The LEA has a director of all reading activities who has the authority, responsibility, and time granted by the superintendent and board of education to organize, implement and coordinate a comprehensive reading program.	4.0	5	4	3	2	1	0
16.	Each LEA has a reporting system that fully, accurately and specifically communicates a student's progress in reading to parents.	3.8	5	4	3	2	1	0
17.	The LEA introduces, explains, and periodically reports the reading program to the school community.	3.3	5	4	3	2	1	0
18.	The LEA shows willingness to share instructional methods and materials which have proved effective in reading programs.	4.0	5	4	3	2	1	0
19.	Teachers of reading at the junior and senior high school levels have a demonstrated knowledge of developmental reading as it relates to the reading curriculum of the LEA.	3.2	5	4	3	2	1	0
20.	Provisions are made for teaching every student at his own instructional level and learning rate.	4.7	5	4	3	2	1	0
21.	The teaching-learning environment is conducive to the development of positive attitudes toward reading.	4.7	5	4	3	2	1	0
22.	Every teacher demonstrates a knowledge of various methods and techniques used in the teaching of reading to make provision for the differences that exist among students.	4.5	5	4	3	2	1	0
23.	Appropriate supplementary reading materials to support the basic reading curriculum are provided and utilized.	4.4	5	4	3	2	1	0
24.	Materials are utilized which recognize different races, cultures, and sexes.	3.7	5	4	3	2	1	0
25.	A wide variety of supportive media on all levels of learning is available and readily accessible.	4.2	5	4	3	2	1	0
26.	Instructional and practice reading materials are filed in a central location in each school for use by all teachers as needed.	4.1	5	4	3	2	1	0

Appendix B: Summary Statistics

ROUND 1

CRITERIA RANK, MEAN, AND STANDARD DEVIATION
TOTAL POPULATION

Rank	Criterion No.	Mean[a]	Standard Deviation	N[b]
1.5	20	4.62	0.85	896
1.5	21	4.62	0.70	895
3	22	4.37	0.96	886
4.5	1	4.35	1.03	880
4.5	23	4.35	0.79	887
6	10	4.26	1.08	894
7.5	12	4.21	1.09	893
7.5	3	4.21	1.00	895
9	25	4.15	0.95	884
10	8	4.11	1.18	896
11	18	4.08	1.00	890
12	15	4.07	1.21	889
13	26	4.02	1.11	884
14	2	3.85	1.26	889
15	14	3.83	1.25	890
16.5	16	3.82	1.15	895
16.5	4	3.82	1.23	889
18	11	3.81	1.22	894
19	9	3.79	1.25	891
20	24	3.73	1.22	884
21	7	3.69	1.31	889
22	19	3.61	1.60	894
23	6	3.56	1.31	893
24	17	3.42	1.16	896
25	13	3.40	1.35	893
26	5	3.18	1.45	890

[a]Importance:

4 to 5 extremely high
3 to 3.99 high
2 to 2.99 medium
1 to 1.99 low

[b]Total N = 919.

ROUND 2

CRITERIA RANK, MEAN, AND STANDARD DEVIATION TOTAL POPULATION

Rank	Criterion No.	Mean[a]	Standard Deviation	N[b]
1	20	4.74	0.62	595
2	21	4.73	0.56	590
3	22	4.62	0.60	590
4	23	4.58	0.64	589
5	1	4.46	0.74	587
6	10	4.42	0.73	590
7	3	4.34	0.76	589
8	25	4.33	0.64	587
9	12	4.30	0.80	592
10	8	4.29	0.75	590
11	18	4.17	0.68	592
12	15	4.16	0.82	584
13	26	4.14	0.78	590
14	14	4.00	0.83	592
15	2	3.91	0.86	587
16	9	3.90	0.84	587
17.5	16	3.87	0.83	593
17.5	11	3.87	0.90	591
19	4	3.82	0.85	582
20	19	3.81	1.08	596
21	7	3.80	0.92	588
22	24	3.78	0.97	589
23	6	3.67	0.84	587
24	13	3.45	1.03	591
25	17	3.39	0.92	593
26	5	3.34	1.00	584

[a]See note a for Round 1, total population.
[b]Total N = 599.

ROUND 1

CRITERIA RANK, MEAN, AND STANDARD DEVIATION
COMMON POPULATION

Rank	Criterion No.	Mean[a]	Standard Deviation	N[b]
1.5	21	4.70	0.56	522
1.5	20	4.70	0.73	521
3	1	4.43	.89	516
4	22	4.41	.94	521
5	23	4.37	.75	521
6	10	4.32	.99	522
7	12	4.26	.99	520
8	3	4.22	.98	523
9	8	4.18	1.08	522
10	25	4.17	.91	519
11	18	4.13	.95	520
12	26	4.08	1.03	519
13	15	4.07	1.22	519
14	2	3.99	1.13	523
15	4	3.91	1.12	521
16	14	3.89	1.14	520
17.5	9	3.85	1.21	522
17.5	16	3.85	1	522
19	11	3.84	.	522
20	24	3.77	'	519
21	7	3.75	1.21	519
22	19	3.68	1.57	522
23	6	3.55	1.26	519
24	17	3.47	1.08	523
25	13	3.43	1.31	521
26	5	3.23	1.41	520

[a]See note a for Round 1, total population.
[b]Total N = 525.

ROUND 2

CRITERIA RANK, MEAN, AND STANDARD DEVIATION
COMMON POPULATION

Rank	Criterion No.	Mean[a]	Standard Deviation	N[b]
1.5	21	4.77	0.47	516
1.5	20	4.77	0.55	521
3	22	4.63	0.61	516
4	23	4.60	0.58	516
5	1	4.47	0.67	515
6	10	4.45	0.66	516
7	25	4.37	0.58	513
8	3	4.33	0.76	515
9	12	4.32	0.75	518
10	8	4.28	0.76	516
11	18	4.19	0.66	520
12	26	4.17	0.75	516
13	15	4.16	0.82	512
14	14	4.00	0.83	518
15	2	3.91	0.86	515
16.5	16	3.90	0.80	519
16.5	9	3.90	0.79	514
18	11	3.87	0.87	517
20.5	4	3.82	0.85	517
20.5	7	3.82	0.91	514
20.5	19	3.82	1.05	522
20.5	24	3.82	.96	515
23	6	3.68	.91	514
24	13	3.48	1.00	518
25	17	3.40	.90	519
26	5	3.33	1.01	511

[a]See note a for Round 1, total population.
[b]Total N = 525.

CHANGE IN MEAN
TOTAL POPULATION vs. COMMON POPULATION

Criterion No.	Total Population			Common Population		
	Round 1	Round 2	Change	Round 1	Round 2	Change
1	4.35	4.46	+.11	4.43	4.47	+.04
2	3.85	3.91	+.05	3.99	3.91	−.07
3	4.21	4.34	+.13	4.22	4.33	+.11
4	3.82	3.82	−.00	3.91	3.82	−.09
5	3.18	3.34	+.15	3.23	3.33	+.10
6	3.56	3.67	+.11	3.55	3.68	+.13
7	3.69	3.79	+.11	3.75	3.82	+.07
8	4.11	4.29	+.18	4.18	4.28	+.10
9	3.79	3.90	+.11	3.85	3.88	+.05
10	4.26	4.42	+.16	4.32	4.45	+.12
11	3.81	3.87	+.06	3.84	3.87	+.03
12	4.21	4.30	+.08	4.26	4.32	+.06
13	3.40	3.45	+.06	3.43	3.48	+.04
14	3.83	4.00	+.17	3.89	4.00	+.11
15	4.07	4.16	+.09	4.07	4.16	+.09
16	3.82	3.87	+.05	3.85	3.90	+.05
17	3.42	3.39	−.03	3.47	3.40	−.08
18	4.08	4.17	+.09	4.13	4.19	+.06
19	3.61	3.81	+.20	3.68	3.82	+.14
20	4.62	4.74	+.12	4.69	4.77	+.09
21	4.62	4.73	+.12	4.70	4.78	+.08
22	4.37	4.62	+.25	4.41	4.63	+.22
23	4.35	4.58	+.23	4.37	4.60	+.23
24	3.73	3.78	+.05	3.77	3.82	+.05
25	4.15	4.33	+.19	4.17	4.37	+.19
26	4.02	4.14	+.11	4.08	4.17	+.08
		Average Change	+.11		Average Change	+.10

CHANGE IN STANDARD DEVIATION
TOTAL POPULATION vs. COMMON POPULATION

Criterion No.	Total Population			Common Population		
	Round 1	Round 2	Change	Round 1	Round 2	Change
1	1.03	0.74	−.29	0.89	0.67	−.23
2	1.26	0.86	−.40	1.13	0.86	−.27
3	1.00	0.76	−.24	0.98	0.76	−.22
4	1.23	0.85	−.38	1.12	0.85	−.27
5	1.45	1.00	−.45	1.41	1.01	−.39
6	1.31	0.84	−.47	1.26	0.91	−.36
7	1.31	0.92	−.39	1.21	0.91	−.31
8	1.18	0.75	−.43	1.08	0.76	−.32
9	1.25	0.84	−.41	1.21	0.79	−.42
10	1.08	0.73	−.35	0.99	0.66	−.33
11	1.22	0.90	−.33	1.15	0.87	−.27
12	1.09	0.80	−.29	0.99	0.75	−.24
13	1.35	1.03	−.32	1.31	1.00	−.31
14	1.25	0.83	−.42	1.14	0.83	−.32
15	1.21	0.82	−.40	1.22	0.82	−.40
16	1.15	0.83	−.32	1.07	0.79	−.28
17	1.16	0.92	−.24	1.08	0.90	−.19
18	1.00	0.68	−.32	0.95	0.66	−.29
19	1.60	1.08	−.52	1.57	1.05	−.52
20	0.85	0.61	−.24	0.73	0.55	−.18
21	0.70	0.56	−.14	0.56	0.47	−.09
22	0.96	0.60	−.36	0.94	0.61	−.33
23	0.79	0.64	−.15	0.75	0.58	−.17
24	1.22	0.97	−.25	1.17	0.96	−.22
25	0.95	0.64	−.31	0.91	0.58	−.32
26	1.11	0.78	−.33	1.03	0.75	−.28
		Average Change	−.34		Average Change	−.29

Appendix C: Individual Statistics

TOTAL POPULATION MEAN RESPONSE
ROUND 1

Criterion No.	Respondent Group																											
	N	1	N	2	N	3	N	4	N	5	N	6	N	7	N	8	N	9	N	10	N	11	N	12	N	13	N	14
1	45	4.56	32	4.47	18	4.28	21	4.57	29	4.76	8	4.87	360	4.34	116	4.43	151	4.07	13	4.69	4	4.50	3	4.00	8	4.37	72	4.32
2	45	4.33	33	4.09	17	3.59	21	4.19	29	4.45	8	4.62	363	3.77	117	3.72	151	3.62	13	4.46	4	4.00	4	4.75	8	3.87	76	4.03
3	45	4.33	33	4.48	18	4.17	21	4.43	29	4.79	8	4.87	365	4.18	117	4.19	153	3.96	13	4.69	5	4.00	4	4.00	8	4.75	76	4.28
4	44	3.66	33	3.97	18	3.72	21	3.62	29	4.24	8	4.50	363	3.76	118	3.75	151	3.75	13	4.46	4	4.50	4	4.25	8	4.25	75	4.00
5	45	3.27	31	3.13	18	3.06	21	2.81	29	3.72	8	4.12	364	3.08	116	3.19	153	3.19	13	3.69	4	3.50	4	4.00	8	3.00	76	3.29
6	44	3.48	33	3.51	18	3.50	21	3.24	29	3.72	8	3.75	365	3.58	118	3.64	153	3.51	13	3.92	4	3.00	4	3.50	8	3.62	75	3.49
7	45	3.67	33	3.91	18	3.56	21	3.62	28	3.75	8	4.62	362	3.62	118	3.70	150	3.69	13	4.00	5	3.40	4	3.75	8	4.00	76	3.75
8	45	4.16	33	4.33	18	3.44	21	4.14	29	4.62	8	4.50	365	4.04	119	4.13	153	4.07	13	4.46	4	3.00	4	4.25	8	4.25	76	4.28
9	45	3.98	33	4.09	18	4.00	21	4.14	29	4.34	8	4.62	362	3.67	119	3.68	151	3.72	12	4.33	5	3.80	4	4.25	8	4.25	76	3.86
10	45	4.07	33	4.45	18	4.06	21	3.95	29	4.31	8	4.87	363	4.22	119	4.34	152	4.28	13	4.38	5	3.80	4	4.50	8	4.50	76	4.34
11	45	4.09	34	4.41	18	3.89	20	3.55	29	4.34	8	4.50	365	3.73	118	3.60	152	3.62	13	4.54	5	3.40	4	3.75	7	4.71	76	4.06
12	45	4.31	34	4.50	18	4.28	20	3.75	29	4.31	8	4.87	365	4.21	118	4.11	152	4.12	12	4.58	5	3.60	4	5.00	8	4.25	75	4.33
13	44	2.91	34	3.68	18	3.28	20	3.05	29	3.45	8	3.87	364	3.47	119	3.55	151	3.26	13	3.61	5	3.20	4	4.25	8	3.37	76	3.22
14	45	4.00	34	4.09	17	3.71	20	4.1	29	4.24		3.87	364	3.75	116	3.93	151	3.67	13	3.77	5	3.80	4	3.75	8	4.25	76	3.93
15	44	4.11	33	4.24	18	4.17	20	4.45	29	4.34	8	4.37	364	3.91	118	4.08	150	4.01	13	4.15	5	4.40	4	4.75	8	4.37	75	4.48
16	44	3.91	34	4.21	18	3.78	20	4.05	29	4.24	8	4.62	366	3.75	119	3.81	152	3.64	13	4.31	4	4.00	4	4.75	8	4.25	76	3.84
17	45	3.62	34	3.76	18	3.56	20	3.70	29	3.97	8	4.37	365	3.26	119	3.39	152	3.18	13	4.15	5	4.40	4	4.75	8	4.25	76	3.60
18	45	3.73	34	4.26	18	3.94	20	4.15	29	4.31	8	4.25	363	4.05	117	4.06	151	4.07	13	4.38	5	4.20	4	4.25	8	4.50	75	4.17
19	45	3.80	34	3.35	18	3.89	20	3.95	29	4.17	8	4.62	363	3.19	119	4.04	152	3.74	13	4.77	5	3.80	4	4.75	8	4.37	76	3.85
20	45	4.58	34	4.53	18	4.50	20	4.65	29	4.89	8	4.75	367	4.69	118	4.44	151	4.53	13	5.00	5	4.80	4	5.00	8	4.87	76	4.60
21	45	4.58	34	4.62	18	4.39	20	4.80	29	4.83	8	4.75	365	4.67	119	4.55	151	4.41	13	4.92	5	4.60	4	5.00	8	4.87	76	4.71
22	44	4.39	33	4.54	17	4.29	20	4.10	29	4.62	8	4.75	364	4.48	117	4.07	150	4.17	12	4.50	5	4.40	4	5.00	8	4.37	75	4.45
23	44	4.41	33	4.36	17	4.29	20	4.35	29	4.48	8	4.62	365	4.36	117	4.26	150	4.30	12	4.58	5	4.20	4	4.75	8	4.50	75	4.29
24	45	3.53	33	3.88	17	3.59	20	3.35	29	4.17	8	4.50	364	3.67	114	3.90	150	3.64	12	4.17	5	3.00	4	3.00	8	3.37	75	3.93
25	45	3.98	33	4.24	16	4.00	20	4.05	29	4.48	8	4.25	362	4.18	117	3.97	150	4.09	12	4.33	5	4.20	4	4.75	8	4.25	75	4.28
26	45	3.93	33	4.06	17	3.71	20	3.55	29	4.34	8	4.50	363	4.05	116	3.92	149	3.99	12	4.08	5	3.80	4	4.50	8	4.25	75	4.13
Total N	45		34		18		21		29		8		369		119		153		13		5		4		8		76	

TOTAL POPULATION STANDARD DEVIATION
ROUND 1

Criterion No.	Respondent Group													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	0.586	0.761	0.752	0.746	0.435	0.354	1.038	0.906	1.367	0.480	0.5771	1.000	0.744	1.032
2	0.674	1.128	0.870	0.749	0.632	0.517	1.247	1.425	1.491	0.660	1.155	0.500	1.642	1.143
3	0.769	0.667	0.514	0.676	0.412	0.354	0.991	1.016	1.297	0.480	0.707	0.816	0.463	0.858
4	1.256	1.045	1.227	1.161	0.786	0.756	1.212	1.315	1.456	0.660	0.577	0.957	0.707	1.078
5	1.175	1.408	1.056	1.123	0.922	0.834	1.603	1.434	1.432	0.751	1.000	0.816	1.512	1.384
6	1.110	1.149	1.098	1.338	0.922	0.886	1.393	1.350	1.367	1.038	0.816	1.291	0.744	1.256
7	0.929	1.331	1.097	1.161	0.751	0.744	1.394	1.348	1.331	1.155	0.894	0.957	0.926	1.367
8	0.767	0.736	1.381	0.793	0.622	0.534	1.284	1.214	1.273	0.519	1.414	0.957	0.886	0.974
9	0.941	0.979	0.907	0.910	0.669	0.517	1.268	1.478	1.327	0.651	0.837	0.500	0.886	1.251
10	0.889	0.711	0.725	1.244	0.761	0.354	1.233	1.027	1.038	0.768	1.095	1.000	0.534	0.946
11	0.793	0.701	0.832	0.826	0.769	0.756	1.293	1.241	1.311	0.877	2.074	1.258	0.488	1.188
12	0.733	0.707	0.752	1.164	0.660	0.354	1.151	1.273	1.173	0.515	1.140	0.00	1.035	0.859
13	1.052	1.121	1.074	1.356	1.055	1.126	1.371	1.339	1.565	0.650	0.837	0.957	0.517	1.302
14	0.879	0.830	1.160	0.968	0.872	1.727	1.342	1.235	1.355	1.301	0.837	1.500	0.707	1.135
15	0.969	1.062	0.923	0.887	1.009	1.768	1.357	1.248	1.170	0.987	0.894	0.500	0.517	0.795
16	0.802	0.880	0.878	0.944	0.689	0.517	1.207	1.262	1.205	0.630	1.155	0.500	0.463	1.178
17	0.886	1.156	0.856	0.923	0.626	0.517	1.221	1.236	1.187	0.801	0.894	0.500	0.707	0.865
18	0.780	0.828	0.725	0.875	0.604	0.886	1.064	1.069	1.043	0.961	1.304	0.957	0.534	0.921
19	1.140	1.921	0.963	1.099	1.136	0.744	1.870	1.092	1.498	0.599	0.837	0.500	0.517	1.354
20	0.657	1.187	0.857	0.587	0.309	0.707	0.753	1.106	0.937	0.0	0.447	0.0	0.354	0.865
21	0.499	0.697	0.608	0.523	0.384	0.707	0.625	0.756	0.982	0.277	0.548	0.0	0.354	0.512
22	0.813	1.003	0.686	1.209	0.622	0.463	0.886	1.179	1.067	1.446	0.894	0.0	0.517	0.741
23	0.622	0.994	0.686	0.671	0.574	0.744	0.789	0.822	0.825	0.515	0.837	0.500	0.534	0.897
24	1.217	1.023	0.712	1.496	0.759	0.756	1.307	1.159	1.233	0.835	0.707	0.816	1.188	1.107
25	0.941	0.708	0.894	0.759	0.738	1.165	0.942	1.141	0.976	0.651	0.837	0.500	1.035	0.815
26	0.986	0.827	1.105	1.191	0.721	0.756	1.125	1.279	1.171	0.515	1.304	0.577	1.035	1.004

TOTAL POPULATION MEAN RESPONSE
ROUND 2

Criterion	Respondent Group																									
No.	N	1	N	2	N	3	N	4	N	5	N	6	N	7	N	8	N	9	N	10	N	11	N	12	N	13	N	14
1	35	4.657	25	4.68	10	4.40	14	4.571	24	4.833	7	5.00	219	4.379	70	4.457	108	4.306	14	4.714	4	4.25	2	4.00	9	4.889	46	4.50
2	35	4.400	25	4.32	10	3.80	14	4.286	24	4.542	7	4.571	218	3.702	70	3.743	108	3.657	14	4.571	5	5.00	2	5.00	9	4.111	46	4.174
3	35	4.600	25	4.68	10	4.40	14	4.571	24	4.875	7	5.00	219	4.288	71	4.338	109	3.982	14	4.786	4	4.25	2	5.00	9	4.667	46	4.391
4	35	4.000	25	3.80	10	3.70	13	3.615	24	4.208	7	4.571	216	3.676	70	3.729	108	3.722	14	4.571	4	4.75	2	5.00	9	4.333	45	4.022
5	35	3.343	25	3.64	10	3.30	14	2.357	24	3.833	7	4.286	215	3.20	71	3.324	108	3.398	14	3.714	4	4.00	2	5.00	9	3.667	46	3.261
6	35	3.314	25	3.88	10	3.50	14	3.571	24	3.833	7	4.286	217	3.664	71	3.690	109	3.670	14	4.286	4	3.25	2	3.50	9	3.778	46	3.522
7	35	3.514	25	4.12	10	3.80	14	3.143	24	3.958	7	4.857	218	3.803	71	3.732	109	3.716	14	4.357	4	3.75	2	1.50	9	4.111	46	3.891
8	35	4.057	25	4.60	10	3.70	14	4.357	24	4.625	7	4.571	219	4.247	71	4.296	109	4.229	14	4.571	5	3.60	2	5.00	9	4.444	46	4.457
9	35	4.171	25	4.32	10	3.90	14	4.286	24	4.333	7	4.429	219	3.753	70	3.814	108	3.750	14	4.357	4	3.50	2	5.00	9	4.444	46	3.935
10	35	4.314	25	4.44	10	4.30	15	4.00	24	4.458	7	4.857	218	4.404	71	4.338	109	4.422	14	4.714	5	4.20	2	4.50	9	4.667	46	4.630
11	35	4.314	24	4.417	9	3.667	14	3.571	24	4.458	7	4.714	221	3.756	72	3.653	109	3.532	14	4.857	4	3.75	2	3.50	9	4.556	47	4.149
12	35	4.257	24	4.625	10	4.10	15	3.867	24	4.458	7	4.571	221	4.267	71	4.296	109	4.239	14	4.643	4	4.25	2	2.50	9	4.333	47	4.468
13	36	3.000	24	3.583	10	3.00	14	2.786	24	3.542	7	4.429	220	3.591	72	3.556	109	3.266	13	4.00	4	3.75	2	2.50	9	3.556	47	3.298
14	36	4.083	23	4.391	10	3.60	14	4.143	24	4.333	7	4.286	221	3.937	72	3.819	109	3.936	14	4.143	4	3.50	2	4.00	9	4.333	47	4.213
15	34	4.059	23	4.217	10	3.90	12	4.333	24	4.417	7	4.571	220	4.086	71	4.141	109	4.009	14	4.429	4	4.75	2	4.50	8	4.50	46	4.522
16	36	3.917	24	4.375	10	3.90	14	3.857	24	4.375	7	4.429	221	3.805	72	3.792	109	3.661	14	4.571	4	4.25	2	4.50	9	4.444	47	3.766
17	35	3.657	24	3.792	10	3.30	15	3.533	24	4.167	7	4.143	222	3.230	72	3.208	108	3.231	14	4.214	4	4.25	2	4.50	9	4.222	47	3.277
18	35	3.857	24	4.25	10	4.10	15	4.133	24	4.208	7	4.143	221	4.163	72	4.292	109	4.110	14	4.286	4	4.00	2	4.50	8	4.625	47	4.213
19	36	4.083	24	4.00	10	3.70	15	4.00	24	4.208	7	4.429	223	3.395	72	4.083	109	3.972	14	4.929	4	4.00	2	4.50	9	4.444	47	3.809
20	36	4.722	24	4.833	10	4.40	14	5.00	24	5.00	7	4.857	223	4.767	72	4.639	109	4.615	14	5.00	4	4.75	2	5.00	9	5.000	47	4.745
21	35	4.686	25	4.80	10	4.40	14	5.00	24	4.875	7	4.714	222	4.766	72	4.708	106	4.613	13	4.846	4	4.75	2	4.50	9	4.889	47	4.766
22	35	4.514	25	4.72	10	4.40	14	4.571	24	4.750	7	4.857	220	4.745	72	4.417	107	4.411	13	4.846	5	4.40	2	5.00	9	4.667	47	4.745
23	35	4.686	25	4.56	10	4.30	14	4.429	24	4.833	7	4.857	221	4.579	72	4.50	107	4.505	13	4.692	4	4.50	2	5.00	8	4.750	47	4.660
24	35	3.571	25	3.68	10	3.60	15	3.40	24	4.292	7	4.714	219	3.648	72	3.903	107	3.785	13	4.308	4	3.25	2	3.50	9	3.556	47	4.128
25	34	4.235	25	4.28	10	4.10	14	4.143	24	4.583	7	4.571	219	4.324	72	4.278	107	4.299	13	4.538	4	4.00	2	5.00	9	4.444	47	4.511
26	35	3.800	25	4.40	10	3.80	14	3.571	24	4.417	7	4.571	221	4.222	72	4.00	107	4.075	13	4.00	4	4.00	2	4.00	9	4.222	47	4.277
Total N	36		25		10		15		24		7		224		72		109		14		5		2		9		47	

TOTAL POPULATION STANDARD DEVIATION
ROUND 2

Criterion No.	Respondent Group													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	0.4816	0.5568	0.5164	0.5136	0.3807	0.0	0.7153	0.7928	0.9418	0.4688	0.9574	0.0	0.3333	0.6912
2	0.5531	0.7483	0.6325	0.6112	0.5882	0.5345	0.8248	0.9276	0.9683	0.6462	0.0	0.0	0.6009	0.5698
3	0.4971	0.6272	0.5164	0.5136	0.3378	0.0	0.7259	0.6312	0.9811	0.5789	0.500	0.0	0.5000	0.7447
4	0.6860	0.8660	0.6749	0.7679	0.6580	0.5345	0.8662	0.8668	0.9052	0.5136	0.500	0.0	0.5000	0.6905
5	0.8023	0.8602	0.9487	0.7449	0.7614	0.7559	1.0599	1.0793	1.0134	0.7263	0.0	0.0	0.7071	0.7727
6	0.8321	1.1299	0.8498	0.5136	0.7020	0.7559	0.9776	0.8716	0.9531	0.8254	0.500	0.7071	0.4410	0.7525
7	0.7017	1.2689	0.7888	1.0095	0.6241	0.3780	0.8104	0.9704	0.9727	0.9419	0.500	2.1213	0.9280	0.9244
8	0.8382	0.5774	0.6749	0.6333	0.4945	1.1339	0.0796	0.9319	0.8123	0.6462	0.5477	0.0	0.5270	0.5852
9	0.5681	0.6904	0.3162	0.4688	0.6370	1.1339	0.8424	1.0397	0.7378	0.7449	0.5774	0.0	0.5270	0.9522
10	0.5298	0.8699	0.6749	0.5345	0.5882	0.3780	0.7389	0.9094	0.7852	0.6112	0.4472	0.7071	0.500	0.5316
11	0.5298	0.8805	0.500	0.7559	0.5090	0.4880	0.8279	0.9217	1.0235	0.3631	0.9574	0.7071	0.7265	0.7512
12	0.5606	0.5758	0.5676	0.7432	0.5090	0.5345	0.8013	0.7999	0.9516	0.4972	0.500	3.5355	0.500	0.6203
13	0.7928	1.1765	0.8165	1.1217	0.6580	0.5345	1.0095	1.0863	1.1275	0.7071	0.500	2.1213	0.5270	0.9305
14	0.7319	0.7223	0.8433	0.6630	0.6370	1.1127	0.7779	0.9543	0.8082	0.7703	1.2910	0.0	0.500	1.0619
15	0.9192	0.6713	0.9944	0.7785	0.5836	0.5345	0.7745	0.9456	0.8221	0.7559	0.500	0.7071	0.7559	0.8094
16	0.5542	0.4945	0.8756	0.6630	0.5758	0.7868	0.8220	0.7680	0.9151	0.6462	0.500	0.7071	0.5270	0.9004
17	0.6835	0.8330	0.4830	0.6399	0.7020	1.0690	0.8752	0.9632	0.9433	0.8018	0.500	0.7071	0.4410	0.9487
18	0.6011	0.5316	0.3162	0.6399	0.6580	1.0690	0.5883	0.5676	0.9461	0.8254	0.8165	0.7071	0.5175	0.5874
19	0.7319	1.0032	0.6749	0.5345	0.5882	0.7868	1.3276	0.8517	0.7872	0.2673	0.0	0.7071	0.5270	0.9002
20	0.5662	0.3807	0.5164	0.0	0.0	0.3780	0.6219	0.6777	0.6370	0.0	0.500	0.0	0.0	0.8462
21	0.4710	0.500	0.5164	0.0	0.3378	0.4880	0.5857	0.5422	0.6700	0.3755	0.500	0.7071	0.3333	0.4761
22	0.5621	0.5416	0.5164	0.6462	0.4423	0.3780	0.5310	0.7827	0.6436	0.3755	0.5477	0.0	0.500	0.5303
23	0.4710	0.5831	0.6749	0.7559	0.3807	0.3780	0.6320	0.7691	0.7187	0.6304	0.5774	0.0	0.4629	0.4790
24	0.8840	1.0296	0.8433	0.6235	0.5500	0.7559	0.9624	0.9518	1.0991	1.0316	0.500	2.1213	0.7265	0.8240
25	0.5537	0.6782	0.5676	0.5345	0.5036	0.5345	0.6425	0.5868	0.7296	0.6602	0.8165	0.0	0.5270	0.6211
26	0.6325	0.5774	0.4216	0.5136	0.5036	0.7868	0.8150	0.8049	0.8092	0.8165	0.0	1.4142	0.4410	0.8522

COMMON POPULATION MEAN RESPONSE
ROUND 1

Criterion No.	Respondent Group																									
	N	1	N	2	N	3	N	4	N	5	N	6	N	7	N	8	N	9	N	10	N	11	N	12	N	13	N	14
1	30	4.600	23	4.435	10	4.200	14	4.643	22	4.727	6	4.833	203	4.369	56	4.571	91	4.286	11	4.636	3	4.667	0	0.0	6	4.667	41	4.390
2	30	4.367	24	4.083	10	3.600	14	4.071	22	4.455	6	4.500	204	3.848	57	3.912	93	3.860	11	4.545	3	4.333	1	5.0	6	3.833	42	4.262
3	30	4.367	24	4.500	10	3.900	14	4.500	22	4.818	6	5.000	204	4.118	57	4.175	93	4.086	11	4.727	3	4.000	1	5.0	6	4.833	42	4.143
4	30	3.800	24	3.792	10	3.600	14	3.500	22	4.273	6	4.500	204	3.784	57	4.070	92	3.967	11	4.455	3	4.667	1	5.0	6	4.500	41	3.976
5	30	3.367	23	3.217	10	3.200	14	2.714	22	3.773	6	4.333	204	3.118	55	3.182	93	3.269	11	3.545	3	3.667	1	5.0	6	3.167	42	3.214
6	29	3.345	24	3.542	10	3.500	14	3.357	22	3.909	6	3.667	203	3.581	57	3.649	93	3.538	11	3.727	2	3.000	1	5.0	6	3.833	41	3.220
7	30	3.633	24	3.917	10	3.800	14	3.357	21	3.905	6	4.833	203	3.616	57	3.789	91	3.846	11	4.091	3	3.333	1	5.0	6	4.000	42	3.929
8	30	4.233	24	4.417	10	3.800	14	4.071	22	4.591	6	4.667	204	4.015	57	4.316	93	4.140	11	4.455	2	3.500	1	4.0	6	4.667	42	4.500
9	30	4.000	24	4.083	10	4.100	14	4.000	22	4.364	6	4.667	204	3.681	57	3.702	93	3.882	10	4.300	3	4.000	1	4.0	6	4.667	42	3.833
10	30	4.133	24	4.375	10	4.100	14	3.786	22	4.409	6	5.000	203	4.291	57	4.298	93	4.505	11	4.273	3	4.333	1	5.0	6	4.500	42	4.286
11	30	4.167	24	4.333	10	3.900	13	3.538	22	4.273	6	4.833	206	3.718	57	3.544	92	3.728	11	4.455	3	2.667	1	4.0	5	4.600	42	4.143
12	30	4.400	24	4.417	10	4.200	13	3.462	22	4.227	6	5.000	206	4.257	56	4.143	92	4.272	10	4.500	3	4.000	1	5.0	6	4.167	41	4.366
13	30	2.867	24	3.625	10	3.300	13	3.000	22	3.409	6	4.000	204	3.505	57	3.561	92	3.391	11	3.545	3	3.000	1	5.0	6	3.333	42	3.286
14	30	4.033	24	4.083	10	3.800	13	4.000	22	4.136	6	4.667	204	3.745	56	4.036	92	3.870	11	3.636	3	3.667	1	3.0	6	4.500	42	4.048
15	29	4.103	23	4.087	10	4.100	13	4.385	22	4.273	6	5.000	206	3.830	57	4.158	91	4.187	11	4.091	3	4.333	1	4.0	6	4.333	41	4.439
16	29	3.966	24	4.125	10	3.700	13	3.923	22	4.273	6	4.833	206	3.733	57	4.000	92	3.685	11	4.273	3	4.333	1	5.0	6	4.333	42	3.762
17	30	3.667	24	3.625	10	3.400	13	3.538	22	3.955	6	4.500	206	3.262	57	3.561	92	3.370	11	4.000	3	4.333	1	5.0	6	4.500	42	3.619
18	30	3.733	24	4.250	10	4.000	13	4.154	22	4.273	6	4.333	205	4.024	56	4.143	91	4.242	11	4.273	3	4.000	1	5.0	6	4.667	42	4.357
19	30	3.833	24	3.042	10	3.600	13	3.923	22	4.091	6	4.833	205	3.224	57	4.246	92	3.935	11	4.727	3	4.330	1	5.0	6	4.500	42	3.952
20	30	4.567	24	4.458	10	4.300	13	4.769	22	4.909	6	5.000	206	4.748	56	4.607	91	4.637	11	5.000	3	5.000	1	5.0	6	4.833	42	4.619
21	30	4.567	24	4.625	10	4.400	13	4.846	22	4.818	6	5.000	206	4.718	57	4.684	91	4.604	11	4.909	3	5.000	1	5.0	6	4.833	42	4.738
22	30	4.433	23	4.522	10	4.300	14	4.000	22	4.682	6	4.833	206	4.495	57	4.123	92	4.217	10	4.900	3	5.000	1	5.0	6	4.333	41	4.463
23	30	4.400	23	4.304	10	4.300	14	4.286	22	4.500	6	4.833	206	4.354	57	4.281	92	4.380	10	4.500	3	4.000	1	5.0	6	4.500	41	4.415
24	30	3.533	23	3.739	10	3.500	14	3.143	22	4.182	6	4.667	205	3.712	56	3.911	92	3.783	10	4.00	3	3.33	1	3.0	6	3.667	41	3.927
25	30	4.100	23	4.217	9	4.111	14	4.143	22	4.500	6	4.500	205	4.200	57	3.982	92	4.076	10	4.200	3	4.000	1	5.0	6	4.500	41	4.293
26	30	4.000	23	4.174	10	3.600	14	3.500	22	4.455	6	4.500	206	4.083	56	3.929	91	4.077	10	4.000	3	4.000	1	4.0	5	4.167	41	4.390
Total N	30		24		10		14		22		6		206		57		93		11		3		1		6		42	

COMMON POPULATION STANDARD DEVIATION
ROUND 1

Criterion No.	Respondent Group													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	0.5632	0.7878	0.7888	0.4972	0.4558	0.4082	0.9474	0.5987	1.1670	0.5045	0.5774	0.0	0.5164	0.9455
2	0.6687	1.2129	0.8433	0.8287	0.6710	0.5477	1.1367	1.2576	1.3154	0.5222	1.1547	0.0	1.9408	0.9386
3	0.8087	0.7223	0.3162	0.6504	0.3948	0.0	1.0391	0.9842	1.1292	0.4671	1.0000	0.0	0.4082	1.0258
4	1.0306	1.1025	1.4298	1.2860	0.7025	0.8367	1.1544	1.0152	1.2443	0.6876	0.5774	0.0	0.5477	1.0837
5	0.9279	1.4128	0.9189	1.2044	0.8691	0.8165	1.5900	1.4154	1.3363	0.6876	1.1547	0.0	1.7224	1.3887
6	0.9738	1.0206	1.2693	1.3363	0.9211	0.8165	1.4306	1.2886	1.1568	1.0090	0.0	0.0	0.7528	1.2552
7	0.9643	1.2825	1.0328	1.2774	0.5390	0.4082	1.3607	1.2209	1.0947	1.0445	1.1547	0.0	1.0954	1.1769
8	0.6261	0.7173	1.0328	0.8287	0.5390	0.5164	1.3186	0.8693	1.1189	0.5222	0.7071	0.0	0.5164	0.7071
9	0.9097	1.0180	0.8756	0.9608	0.7267	0.5164	1.2909	1.4634	1.1595	0.6749	1.00	0.0	0.5164	1.2863
10	0.8604	0.7109	0.8756	1.3688	0.7341	0.0	1.1254	1.1175	0.6190	0.7862	0.5774	0.0	0.5477	1.1324
11	0.7915	0.7020	0.8756	0.8771	0.8270	0.4082	1.1887	1.1031	1.2324	0.9342	2.5166	0.0	0.5477	1.2010
12	0.7240	0.7173	0.9189	1.2659	0.6119	0.0	1.0485	1.1666	0.9345	0.5270	1.000	0.0	1.1690	0.9153
13	1.0030	1.1349	1.3375	1.4720	1.0075	0.8944	1.3482	1.2538	1.5043	0.5222	1.000	0.0	0.5164	1.3304
14	0.8087	0.7755	1.1353	0.9129	0.8888	0.5164	1.2918	1.1436	1.1408	1.3618	0.5774	0.0	0.5477	0.9615
15	0.9002	1.1644	1.1005	0.9608	1.0771	0.0	1.4433	1.2362	0.9990	1.0445	1.1547	0.0	0.5164	0.8674
16	0.8653	0.9470	0.9487	1.0377	0.7025	0.4082	1.1652	1.0690	1.0047	0.6467	1.1547	0.0	0.5164	1.1855
17	0.8841	1.3126	0.8433	0.9674	0.6530	0.5477	1.1430	1.1183	1.0661	0.7746	1.1547	0.0	0.5477	0.8821
18	0.8277	0.8470	0.8165	0.8987	0.6311	0.8165	1.0730	0.9425	0.7355	1.0090	1.7321	0.0	0.5164	0.9324
19	1.1472	2.0104	1.1738	1.3205	1.2690	0.4082	1.8064	0.9312	1.3652	0.6467	0.5774	0.0	0.5477	1.3784
20	0.6261	1.2847	1.0593	0.4385	0.2942	0.0	0.6434	0.8879	0.6586	0.0	0.0	0.0	0.4082	0.9094
21	0.5040	0.5758	0.6992	0.3755	0.3948	0.0	0.5745	0.5398	0.6646	0.3015	0.0	0.0	0.4082	0.4968
22	0.8172	1.1229	0.8233	1.4142	0.6463	0.4082	0.8653	1.1963	1.0465	0.3162	0.0	0.0	0.5164	0.6744
23	0.6747	1.1051	0.6749	0.7263	0.5976	0.4082	0.7875	0.6749	0.6929	0.5270	1.00	0.0	0.5477	0.8055
24	1.2243	1.0539	0.8498	1.4601	0.7950	0.8165	1.2367	1.1326	1.1467	0.8165	0.5774	0.0	0.8165	1.2327
25	0.7509	0.6713	1.0541	0.7703	0.7400	0.8367	0.8655	1.2025	0.9634	0.6325	1.00	0.0	0.5477	0.9285
26	0.8305	0.7168	1.4298	1.2860	0.6710	0.8367	1.0629	1.2484	1.0670	0.4714	1.7321	0.0	1.1690	0.6276

COMMON POPULATION MEAN RESPONSE
ROUND 2

Criterion	Respondent Group																											
No.	N	1	N	2	N	3	N	4	N	5	N	6	N	7	N	8	N	9	N	10	N	11	N	12	N	13	N	14
1	29	4.621	24	4.667	10	4.40	13	4.538	22	4.818	6	5.00	202	4.401	56	4.411	92	4.413	11	4.727	2	5.0	1	4.0	6	4.833	41	4.439
2	29	4.448	24	4.333	10	3.80	13	4.308	22	4.591	6	4.50	201	3.701	56	3.786	92	3.663	11	4.636	3	5.0	1	5.0	6	4.167	41	4.122
3	29	4.586	24	4.667	10	4.40	13	4.538	22	4.864	6	5.00	201	4.259	56	4.339	93	4.011	11	4.727	2	4.5	1	5.0	6	4.667	41	4.366
4	29	4.069	24	3.792	10	3.70	12	3.583	22	4.227	6	4.50	198	3.667	56	3.768	92	3.772	11	4.636	2	5.0	1	5.0	6	4.167	40	4.000
5	29	3.345	24	3.667	10	3.30	13	2.308	22	3.818	6	4.333	198	3.202	56	3.357	92	3.370	11	3.818	2	4.0	1	5.0	6	3.833	41	3.220
6	29	3.379	24	3.917	10	3.50	13	3.538	22	3.818	6	4.50	200	3.650	56	3.714	93	3.688	11	4.545	2	3.0	1	3.0	6	3.667	41	3.512
7	29	3.448	24	4.125	10	3.80	13	3.154	22	4.000	6	5.00	200	3.80	56	3.750	93	3.796	11	4.364	2	3.5	1	3.0	6	4.167	41	3.927
8	29	4.000	24	4.625	10	3.70	13	4.385	22	4.591	6	4.50	201	4.239	56	4.232	93	4.269	11	4.455	3	3.667	1	5.0	6	4.500	41	4.415
9	29	4.138	24	4.292	10	3.90	13	4.308	22	4.273	6	4.333	201	3.786	56	3.804	92	3.772	11	4.364	2	3.500	1	5.0	6	4.333	41	3.854
10	29	4.276	24	4.458	10	4.30	14	4.000	22	4.455	6	4.833	200	4.430	56	4.411	93	4.484	11	4.909	3	4.000	1	5.0	6	4.667	41	4.585
11	29	4.345	23	4.435	9	3.667	13	3.538	22	4.500	6	4.667	203	3.759	57	3.649	93	3.602	11	4.909	2	3.000	1	3.0	6	4.500	42	4.119
12	29	4.276	23	4.609	10	4.10	14	3.857	22	4.455	6	4.667	203	4.286	56	4.304	93	4.312	11	4.727	2	4.000	1	5.0	6	4.333	42	4.429
13	30	3.033	23	3.652	10	3.00	13	2.692	22	3.545	6	4.333	202	3.604	57	3.614	93	3.301	11	4.091	2	3.500	1	4.0	6	3.333	42	3.310
14	30	4.067	22	4.409	10	3.60	13	4.154	22	4.273	6	4.167	203	3.941	57	3.842	93	4.000	11	4.091	2	3.000	1	4.0	6	4.333	42	4.143
15	28	4.071	22	4.182	10	3.90	12	4.333	22	4.455	6	4.667	202	4.099	57	4.123	93	3.978	11	4.545	2	5.000	1	5.0	5	4.400	41	4.512
16	30	3.967	23	4.391	10	3.90	13	3.846	22	4.409	6	4.500	203	3.818	57	3.842	93	3.753	11	4.636	2	4.500	1	5.0	6	4.667	42	3.714
17	29	3.621	23	3.739	10	3.30	14	3.500	22	4.227	6	4.167	204	3.235	57	3.228	92	3.304	11	4.273	2	4.500	1	5.0	6	4.333	42	3.262
18	29	3.862	23	4.261	10	4.10	14	4.143	22	4.273	6	4.167	204	4.157	57	4.333	93	4.183	11	4.364	2	4.000	1	5.0	6	4.500	42	4.214
19	30	4.000	23	4.000	10	3.70	14	4.071	22	4.182	6	4.667	205	3.424	57	4.158	93	4.054	11	4.909	2	4.000	1	5.0	6	4.333	42	3.762
20	30	4.667	23	4.826	10	4.40	13	5.000	22	5.000	6	5.000	205	4.810	57	4.684	93	4.688	11	5.000	2	5.000	1	5.0	6	5.000	42	4.714
21	29	4.724	24	4.792	10	4.40	13	5.000	22	4.909	6	4.833	204	4.809	57	4.737	90	4.700	10	4.900	2	5.000	1	5.0	6	4.833	42	4.738
22	29	4.517	24	4.708	10	4.40	13	4.615	22	4.727	6	5.000	202	4.748	57	4.404	91	4.418	10	4.800	3	4.667	1	5.0	6	4.667	42	4.714
23	29	4.759	24	4.542	10	4.30	13	4.385	22	4.818	6	5.000	203	4.596	57	4.491	91	4.571	10	4.700	2	4.500	1	5.0	6	4.667	42	4.619
24	29	3.655	24	3.708	10	3.60	14	3.429	22	4.318	6	5.000	201	3.672	57	3.965	91	3.835	10	4.400	2	3.500	1	2.0	6	3.500	42	4.167
25	28	4.286	24	4.250	10	4.10	13	4.154	22	4.591	6	4.667	201	4.348	57	4.351	91	4.374	10	4.500	2	4.000	1	5.0	6	4.667	42	4.452
26	29	3.828	24	4.417	10	3.80	13	3.615	22	4.409	6	4.500	203	4.251	57	4.035	91	4.121	10	4.000	2	4.000	1	5.0	6	4.167	42	4.238
Total N	30		24		10		14		22		6		206		57		93		11		3		1		8		42	

COMMON POPULATION STANDARD DEVIATION
ROUND 2

Criterion No.	Respondent Group 1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	0.4938	0.5647	0.5164	0.5189	0.3948	0.0	0.6485	0.8263	0.7435	0.4671	0.0	0.0	0.4082	0.7088
2	0.5724	0.7614	0.6325	0.6304	0.5903	0.5477	0.8429	0.9670	0.9051	0.5045	0.0	0.0	0.7528	0.5566
3	0.5012	0.6370	0.5164	0.5189	0.3513	0.0	0.7299	0.6113	1.0054	0.6467	0.7071	0.0	0.5164	0.7334
4	0.7036	0.8836	0.6749	0.7930	0.6853	0.5477	0.8842	0.8942	0.8657	0.5045	0.0	0.0	0.4082	0.6794
5	0.8567	0.8681	0.9487	0.7511	0.7950	0.8165	1.0566	1.0519	1.0453	0.7508	0.0	0.0	0.7528	0.7910
6	0.8625	1.1389	0.8498	0.5189	0.7327	0.5477	0.9444	0.8026	0.9888	0.5222	0.0	0.0	0.5164	0.7114
7	0.7361	1.2959	0.7888	1.1435	0.6172	0.0	0.8082	1.0313	0.9036	0.9244	0.7071	0.0	1.1690	0.9053
8	0.8452	0.5758	0.6749	0.6504	0.5032	1.2247	0.6875	1.0089	0.8359	0.6876	0.5774	0.0	0.5477	0.5906
9	0.5009	0.6903	0.3162	0.4804	0.6311	1.2111	0.7204	1.1188	0.6970	0.8090	0.7071	0.0	0.5164	0.9634
10	0.5276	0.8836	0.6749	0.5547	0.5958	0.4082	0.6763	0.8040	0.6188	0.3015	0.0	0.0	0.5164	0.5466
11	0.5526	0.8958	0.5000	0.7763	0.5118	0.5164	0.7935	1.0087	0.9106	0.3015	0.0	0.0	0.8367	0.7715
12	0.5914	0.5830	0.5676	0.7703	0.5096	0.5164	0.7494	0.8511	0.8844	0.4671	0.0	0.0	0.5164	0.6302
13	0.8503	1.1524	0.8165	1.1094	0.6710	0.5164	0.9472	1.1300	1.0712	0.7006	0.7071	0.0	0.5164	0.9497
14	0.7397	0.7341	0.8433	0.6887	0.6311	1.1690	0.7356	1.0315	0.7802	0.8312	1.4142	0.0	0.5164	1.0948
15	0.9400	0.6645	0.9944	0.7785	0.5096	0.5164	0.7194	1.0363	0.8595	0.6876	0.0	0.0	0.8944	0.8403
16	0.5561	0.4990	0.8756	0.6887	0.5032	0.8367	0.7843	0.7971	0.7612	0.6742	0.7071	0.0	0.5164	0.9699
17	0.6769	0.8100	0.4830	0.6504	0.6853	1.1690	0.8501	1.0525	0.7948	0.7862	0.7071	0.0	0.5164	0.9892
18	0.6394	0.5408	0.3162	0.6630	0.6311	1.1690	0.5913	0.5455	0.8716	0.8090	0.0	0.0	0.5477	0.5646
19	0.6948	1.0871	0.6749	0.4746	0.5885	0.5164	1.3025	0.7268	0.6144	0.3015	0.0	0.0	0.5164	0.9055
20	0.6065	0.3876	0.5164	0.0	0.0	0.5028	0.6855	0.5103	0.0	0.0	0.0	0.0	0.0	0.8913
21	0.4549	0.5090	0.5164	0.0	0.2942	0.4082	0.4737	0.5518	0.4608	0.3162	0.0	0.0	0.4082	0.4968
22	0.5745	0.5500	0.5164	0.6504	0.4558	0.0	0.5377	0.8422	0.6509	0.4216	0.5774	0.0	0.5164	0.5537
23	0.4355	0.5882	0.6749	0.7679	0.3948	0.0	0.5490	0.8045	0.5404	0.6749	0.7071	0.0	0.5164	0.4915
24	0.8567	1.0417	0.8433	0.6462	0.5679	0.0	0.9495	1.0171	1.0139	1.0750	0.7071	0.0	0.8367	0.8530
25	0.5998	0.6757	0.5676	0.5547	0.5032	0.5164	0.5728	0.5822	0.5507	0.7071	1.4142	0.0	0.5164	0.6325
26	0.6584	0.5836	0.4216	0.5064	0.5032	0.8367	0.7714	0.8010	0.6966	0.9428	0.0	0.0	0.4082	0.8782

Appendix D: Data Analysis

DATA ANALYSIS

All data analysis performed for the Delphi study was done on an IBM 370/168 computer. The means, standard deviations, and sample sizes (N) were obtained from a statistical summary (STSUM) program which is part of Penn State's statistical package (STPAC).

STPAC is a collection of statistical routines that has evolved with the development of Penn State's Computation Center. The programs originated from a variety of sources; however, they have all been modified so that they run under a single control program using standardized control instructions and input conventions.

STSUM is a FORTRAN IV program written by a member of the computation center staff. It is designed to be used as an independent processing program for computing summary statistics. Data input to STSUM is a matrix in which the columns represent variables or treatments, and the rows represent the observational units. In our data analysis, we have 26 variables, representing the 26 items on the questionnaire. The number of treatments or observations is the number of respondents. These observations vary in number for various groups, but in the common population (those 525 individuals who responded to both the first and second questionnaire), the number of observations is constant.

Computational formulas used in STSUM are the following:

1. Number (N) = number of observational units for a variable
2. Total = sum of observational unit values for a variable = $\sum_{i=1}^{N} X$

A complete description of STSUM is available from The Computation Center, The Pennsylvania State University, University Park, Pennsylvania.

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